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A VEGETABLE GROWER'S HANDBOOK

A Vegetable Grower's Handbook

BY

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PREFACE

THERE are so many gardening manuals in existence that it seems presumptuous to add to them. They range from ponderous and learned volumes written by acknowledged authorities to manuals which stop just at the point on which more information is wanted.

This book is for those who have not the time to study the former type of book, but it has been our ambition to embody as much as is of practical value to be found in these authorities in untechnical language, and this, combined with the experience of two enthusiastic gardeners, may, we hope, make this small book of help to those people who, like ourselves, are fortunate enough to be their own gardeners. (One cannot help feeling that those who do not work in their own gardens know very little of the joys of gardening. It must be very poor fun to own a ten-acre garden, for instance, and not be allowed to work in it!)

We have throughout this book laid special stress on the preparation of the ground and the keeping of it in right condition. When Adam was given a garden he was told to dig it, and the greatest authorities on gardening in all ages and of all civilizations have enlarged on this simple and infinitely wonderful lesson.

The large majority of amateurs give their attention to the plants rather than to the soil, whereas digging is the foundation of all good gardening, and no amount of after-care of the plants can ever compensate for lack of thorough work in this direction.

Second only in importance to digging is the care of seedlings. The well-being of plants in maturity is just as dependent on their treatment in the seedling stage as that of humans depends on their treatment when they are babies. We have given a small section to this important subject, and under each vegetable we have emphasized what is more important in the seedling stage, for only a well-tended seedling can come to perfect maturity.

Lastly, we should like to lay stress on treating the plants as intelligent creatures. Science has not yet discovered the extent of their intelligence, but no real gardener ever doubts it for a moment. No gardening book can ever teach one as much as plants themselves. They respond to love and sympathy just as much as any other creatures, and their language is so simple that a child who loves them understands it.

E. S. R.

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Section I

SEED SOWING AND CARE OF SEEDLINGS

Seed Sowing. If seed is to germinate it must be cosy and comfortable. There must be a certain amount of warm moisture in the soil to set up the fermentation of the chemicals contained in the seed case, and to start the life-germ into action. Cold wet soil is fatal to germination; some of the seeds may struggle through their cases, but the crop will be poor. The surface soil must also be porous, or the rays of the sun cannot penetrate and draw out the tiny first top growth when it has broken through the seed case. Surface soil, therefore, must be well prepared and mixed with wood-ashes, finely-sifted rotted manure, etc.

It is impossible to go by any fixed rules for sowing seeds in spring. It is a very usual mistake to sow too early: one is so keen to get to work directly the first day of spring sunshine comes, but nothing is gained by this. There must be genial warmth in the ground. Warm moist earth is what a seed wants, not cold wet soil. The first means healthy germination, the second entire rot or partial decay. Large seeds—peas, beans, etc.—can more or less look after themselves, so to speak; but the smaller and lighter sorts require their mother earth to be a little warm and comfortable before they are committed to her care.

Where soil is cold and clayey do not sow until the rake can be drawn over the bed without any earth sticking to it. It is far better to sow on a dry mid-April day than in bitter weather in late March. You will get your crops just as soon, and they will be far healthier.

Though no fresh manure should be put in a bed prepared for seeds, it is quite an exploded idea that well-rotted stuff thoroughly sifted does harm to seeds. The French and Belgians bring along most of their early salads and root crops in soil containing quite a lot of well-rotted, sifted manure.

Some gardeners believe in sinking seed beds slightly so that the sides of the tender plants are protected from cutting winds, but it is best to " fence round " the plot with laths of wood or evergreen boughs about six inches high.

Open up all drills for seed sowing early on a sunny day to let the sun pour on them to warm the soil before the seeds are covered in. The beneficial results are great.

Seeds to stand the winter, such as lettuces, cauliflowers, and onions, should be sown after rain if possible. If the seed can germinate in the soil's natural moisture it will be far better for it than any artificial watering, but if rain chooses to keep aloof it is wise to give the seed bed a good soaking the day before sowing.

Unless a garden is in the country, or has a particularly fine soil, it is best to raise seedlings in boxes, and while they are germinating, the nursery bed can be prepared. It must be thoroughly dug, but none of the subsoil should be brought to the surface. No fresh manure should be worked in, but if you have any so well rotted that you cannot tell it from fine soil, or any rotted leaf mould, this, with any burnt rubbish well sifted, is ideal. Keep the burnt rubble for the top dressing: this is just the right stuff for nourishing plants at an early stage of growth, and tender rootlets love to roam in it. The spot chosen for a nursery bed should be as high and dry as possible if the plants have to stand through the winter in it. If it is inclined to be damp, it is well worth the trouble of raising it. The foundation may be any old rotted manure, as long as it is sweet and free from insect pests.

In spring sowing remember to protect the seedlings when they are up from cutting winds, and for seeds to stand the winter the chief thing to guard against is stagnant moisture. Frost is not nearly so injurious; in fact, it makes them sturdier.

Seedlings. The seedlings should have attention as soon as they are big enough to handle in order to obtain sturdy plants. If seedlings are left long in a crowded condition they will wither or damp off, or be too leggy and poor to be worth the trouble of planting out. Seedlings cannot endure being left huddled together; it is just as bad as overcrowding children, and good results cannot be expected from seedlings which have been ill-treated in this way.

In planting treat them gently and firmly. See that the roots are comfortable. Plant in thoroughly well-dug ground and press the soil firmly round their roots.

We are only gradually learning how wonderful the intelligence of plants is, and certainly to treat them as though they were neither intelligent nor sensitive is to court disaster. When seedlings are firmly and comfortably established, they know quite well what is expected of them and get to work as soon as they can, but if they are put in just anyhow they naturally take very little trouble, and probably have the poorest opinion of the capacity of some humans.

At the time of setting out plants are generally upright and stiff because their leaves are yet full of moisture absorbed by their roots, but as soon as the roots are disturbed they, for a time, cease to work. They have to settle down in new soil to search for moisture in it, and in the meantime if they are unshaded the sap in the stems and leaves is being drawn up by the sun and air. Tiny seedlings have very little reserve moisture, and the longer they are left exposed the less chance they will have to recover.

One's object should be then to keep all newly planted foliage fresh and moist; and shading for a few days makes all the difference. Even if plants exposed to the sun survive they never come along like those that have never been allowed to flag. A flower-pot over each seedling is ideal, but where this is not possible bent cardboard placed tent-fashion over the rows will do: or they may even be shaded by any light material (raised here and there above the foliage) liberally sprinkled with water every now and then.

Transplant in showery weather or after rain, and only take a few seedlings at a time from seed beds and boxes. Even these few should be covered with a damp cloth and each plant taken separately from under cover. The rootlets of baby plants are often finer than a hair, and as there is a mouth at the extreme end of each rootlet with which the plant must draw up the moisture, it is of the greatest importance that rootlets should be kept in a moist state. Dry roots spell death or, at best, a crippled existence. Shade after transplanting until the plants cease to wilt.

In nipping off a bit of the tough tap roots of broccoli and other greens cut them with a very sharp knife. If done by hand the surface is often left jagged, and jags set up disease. Seedling greens are often "puddled in," *i.e.*, immersed in a thick paste made of clay or heavy soil and water, but sometimes the roots are so tightly balled up in heavy damp soil that they must have a struggle to get clear of it. A happy medium is the thing. Always water till the seedlings are established.

Give all nursery beds, whether they contain seedling flowers or vegetables, a frequent overhauling, clearing off any fallen leaves, bits of twig, etc. (which encourage coral rash in the soil), and any other rubbish, hoeing continually to let in air and warmth, and dressing the plot with a mixture of spent soot and lime. A well-cared for seedling makes a perfect plant.

In pricking out seedlings into larger pots both pots and drainage crocks must be quite clean. Before the crocks are put in, a small piece of old sponge or any old rag should be smothered with soot and placed over the drainage hole; it is fine for keeping insects away. Do not fill the pots right to the brims or water will overflow every time.

Use the right compost for each subject. Cuttings and seedlings are always more robust when planted at the edge of pots instead of the centre. If pots of seedlings happen to become overdry the best plan is to immerse them in a pail of water instead of watering in the usual way. Don't knock plants out of tiny pots on stones; fragile young growth is often damaged in this way. Poke your finger through the drainage hole or use a little stick carefully.

Soil for Rare Seeds. Put soil to be used for special seeds in an old pan and heat it over the fire to free it entirely from insect pests. This little trouble will amply repay you. Baking soil, either in the oven or on top of the fire, is, however, a tiresome process, and another way, nearly as good, is to put the soil in an old bath with a hole in it, or some other defective vessel, and to pour boiling water over it. Allow this to drain away, and then repeat the process. Few insects will survive this treatment, although some of their eggs may, for the casings of many eggs are exceedingly hard and tough.

Sifting Soil for Seedlings. It is very easy to overdo sifting soil for seed boxes. Fine seeds it is true cannot germinate in hard clods of soil, but having germinated, many seedlings like to find something they can grip on to as they take root. Surface soil should be well sifted, but the under soil for most things may have bits of turfy loam in it of any size from a pea to a cob nut. Many seedlings make surface roots very quickly; tomatoes, especially, do this, and they love to be able to steady themselves on a piece of fibrous loam of a decent size. In lifting seedlings this is very noticeable.

Watering Seedlings. See *Watering*, page 162.
Protecting Seedlings in Frames. See also page 150.

SECTION II

VEGETABLES

ARTICHOKES

CHINESE ARTICHOKE. *Stachys tuberifera.* Herbaceous perennial. Strictly speaking, not an artichoke at all, for it belongs to the same family (*stachys*) as the garden lamb's-ear and the wild betony. Its native habitat is China and Japan. It was introduced into this country in 1897 and was the vegetable novelty of the year, but considering that it has all the popular virtues it has been curiously slow in coming into favour. Chinese artichokes are quite hardy, extremely prolific, and of the easiest culture. They are as easily cooked as Jerusalem artichokes, and are usually much more appreciated. They do not succeed on cold, heavy soils, but they do well on sandy soils.

Select a piece of ground which has been well manured for a previous crop, but give no fresh manure. Dig thoroughly and give a dressing of salt and soot. Plant the tubers at the end of March or early in April, three inches deep and one foot apart, allowing eighteen inches between the rows. It is essential to keep the ground between the rows well hoed, and to water in dry weather. They can be left in the ground and dug as required, or lifted in October and stored in sand. The tubers are about three inches long, and the top growth of the plant is shrub-like.

Chinese artichokes grown for exhibition purposes are left in the ground till needed, as this preserves their colour. In any case they should not be exposed unnecessarily to light or they lose their delicate ivory tint.

GLOBE ARTICHOKE. *Cynara Scolymus.* Herbaceous perennial. One of the oldest cultivated vegetables in the world. It derives its name from the Arabic *Alkharshuf,* and as a vegetable it was highly esteemed by the Greeks and Romans. Unlike some vegetables, globe artichokes do not make the best of poor conditions, and it is useless to attempt them unless they can be given thorough cultivation.

The ground must be trenched and liberally enriched with manure in autumn. On heavy soils add wood-ashes liberally. On sandy soils salt is beneficial. The plants can be raised from seed, but this is not advisable, for they do not always come true to type.

Propagate from suckers about nine inches long, taken (with as many roots as possible) in November and wintered in pots or boxes in a cold frame. Stand the pots or boxes on ashes to protect from slugs, etc. Or suckers may be removed in mid-April when they must be planted in firm ground four feet apart each way. Protect each sucker from slugs with coal-ashes, and water liberally in dry weather. Mulch with well-rotted manure only when well established.

All flower stems must be removed the first year as soon as they appear. The plants must be well protected with coal-ashes through the winter. The following season, when they will produce heads fit for cutting, they should be given regular and liberal applications of liquid manure.

The heads must be cut as soon as they are fully grown. If cut too young they are flavourless, and if too old they are hard. If not needed immediately, cut, when ready, with long stalks and stand in shade. Change the water daily, and cut a small piece off the ends of the stalks and they will keep fresh for some time.

To increase the size of the main heads, cut off all laterals when an inch long. On strong richly manured soils plantations are sometimes left six years, but three years is the usual time. Remove all dead leaves and rubbish in late autumn, and heap over and round with coal-ashes to protect the crown. In very cold districts the additional protection of bracken or litter may be necessary. Remove all protection early in April, but not if the weather is unfavourable.

There are many varieties of globe artichoke, but seedsmen as a rule only list the two best—the Large Green Globe and the Purple Globe. The former, which has rounded segments and no prickles, is best for general purposes in this country.

JERUSALEM ARTICHOKE. *Helianthus tuberosus.* Hardy herbaceous perennial. A native of Canada and the northern parts of U.S.A. In some parts of Russia the peasants consume the seeds of the giant sunflower, but otherwise the Jerusalem artichoke is the only member of the sunflower tribe used for human food. The Red Indians, who cultivated and appreciated them, taught our colonists the use of them, and they were introduced into this country about 1617. The name Jerusalem is a corruption of the Italian *girasol*—sunflower or helianthus.

Jerusalem artichokes are, as a rule, grown so crowded that the tubers are not worth lifting. They are so nutritious that it seems a pity that the little they want, *i.e.*, proper space, they rarely get. Given two to three feet apart each way, they produce quantities of magnificent tubers which are easy to pare, whereas tiny, stunted ones are hardly worth the trouble. They prefer a sandy to a clay soil, but will thrive almost anywhere.

Plant in February or March in well-dug soil enriched with manure the previous autumn, and put each tuber six inches deep. If earthed up similarly to potatoes when they are about six inches above ground, the crop is very much improved. Stakes should be planted at each corner of the plantation and a light rope run round, as being buffeted by strong winds when the stems are ten feet high is very injurious to the crop. They are quite frost-proof, and may be dug as required through the winter. If stored they should be put in a cool, dry place, for, if in a warm place, they are apt to shrivel.

When setting aside Jerusalem artichokes for next season's seed choose those that will not break into too many eyes. It is not as generally known as it might be that grated raw artichoke is as wholesome and excellent an addition to a winter salad as grated raw apple.

The stems, if they are big and strong (as they should be), may be stripped of their leaves, tied in bundles, and stored to use as sticks for runner beans. The old purple artichoke is the commonest variety. The white are much better as they have shallower eyes and the flavour is better. A new variety has been introduced which is pale rose in colour. This is a heavy cropper.

ASPARAGUS

ASPARAGUS. *Asparagus officinalis.* Hardy herbaceous perennial. A native plant, and found wild on the Cornish coast. It grows abundantly in Greece and on the salt steppes of Poland and South Russia, but always where there is an abundance of salt in the soil or air. It has been in use as a vegetable for at least 2,000 years, and modern skill has not yet excelled that of the ancient Roman gardeners who could grow asparagus of which three heads weighed a pound.

Preparation of Beds. A well-made asparagus bed will go on bearing for quite twenty years, and is therefore worth any trouble. Asparagus likes good loam with a porous subsoil. On sandy, well-drained soils it may be planted on the flat, but on heavy soils the beds should be raised about a foot.

Trench the beds, which should not exceed four feet in width (to avoid tramping on them once the plantation is made), in the autumn, incorporating well-rotted manure in the bottom spit, and in the other two spits old mortar rubbish, well-rotted manure, and sand (unless the soil is naturally sandy).

Raising Asparagus from Seed. Some experts advocate the planting of the asparagus seeds where they are to remain, and others that seedlings should be transplanted to permanent quarters.

The distances between the rows is also a matter of opinion, but whereas at first close planting produces more than wide planting, the sticks are neither early nor large, and as time goes on the whole ground soon becomes a mass of roots. There is then insufficient nourishment and moisture, and the sticks deteriorate.

The best sticks will be raised if planted three feet six inches to four feet apart in the rows and two feet between the plants. In the districts round Paris, where the giant asparagus is produced, the plants are set four feet apart each way.

Sow the seed one inch deep in March or April. Make the bed very firm by rolling. Asparagus seed germinates slowly, and it is advisable to sow radish thinly between, merely in order to mark the rows. Thereby it is possible to hoe almost immediately, and it is of vital importance to keep the bed clear of weeds from the first. But the practice of cropping new asparagus beds with salads, etc., is disapproved by the best authorities.

Thin the seedlings to three inches apart, and when well advanced sprinkle spent soot lightly along the rows. They need copious watering in dry weather and continual hoeing. The latter must be done carefully to avoid root disturbance. They are surface rooting.

Transplanting. Many of the best-known growers advocate transplanting one-year-old plants, as they root sooner, but when purchasing it is better to get two-year-old plants unless one can be certain that the yearlings are strong plants.

As little time as possible should be allowed to elapse between lifting and planting, and the roots must never be exposed to sun or wind.

Cover the lifted roots with a damp sack, and only put a few at a time in the trench before covering with soil. The actual planting is of paramount importance, and if this is carelessly done the crop will never be satisfactory. Dig out the trenches twelve inches deep and twelve inches wide. Make a mound along the centre of each of sifted good earth, thus , six inches high, and spread the roots carefully over each side. When the earth is replaced the crowns should be from five to six inches below the surface. Press moderately firmly. Transplanting should be done in March or early April when growth is just showing above ground.

General Care of the Asparagus Bed. Asparagus is a very fastidious plant, and the beds must always be kept rigorously free of weeds. They must always be hand-weeded for fear of injury to the crowns.

Never cut asparagus heads, however freely they grow, the first year, and only sparingly the second year. This is most important.

All asparagus beds should have stakes at each corner and a thin rope run round. If the feathery greenery is battered and blown about by rough winds future crops suffer severely. When the foliage begins to turn yellow it must all be sheared down. It is exhausting to the plant to allow the berries to form and ripen.

Manures. Top dress in April with spent soot, salt, and one of the reliable advertised plant foods, mixed in equal quantities. Scatter round the roots after rain. Top dress in November with seaweed (if obtainable), mixed with well-rotted horse or cow manure. Apply common salt, one ounce to a square yard, once a month from May to September, or in liquid form two ounces to each gallon of water applied in May and July. Liquid manure to be given freely from April to September.

Cutting. Strictly speaking, cutting should not begin till the third year, and then only a few shoots should be taken from each plant, and none after the first week in June. In following years, no cutting after the third week in June. Begin cutting when the shoots show three to four inches above the soil. Cut the shoot with an asparagus knife about four inches below the surface, taking great care not to injure new shoots rising. Some growers on light soils break instead of cutting.

Asparagus Beetle. Confined to southern counties and almost unknown in the north. Both beetle and grub attack the plant. The shoots are covered with masses of sticky eggs. The only satisfactory way to get rid of the eggs and larvae during the cutting season is by running one's hand (previously dipped in paraffin) over the sticks. After cutting is over, spray with arsenate of lead.

Asparagus Fly. Its ravages can easily be distinguished from the above as the shoots attacked turn yellow and rot at the base. During the cutting season cut out all affected shoots below the ground line and burn them. In the autumn dig up and burn all the dead stumps and burn all tops.

Asparagus Rust. The foliage turns yellowish soon after midsummer and the stems have blisters on them. The spores of the fungus are under these blisters, and the disease is spread by the wind. If neglected, this disease will destroy whole beds very rapidly. Spray thoroughly and carefully with Bordeaux mixture.

BEANS

BROAD BEANS. *Vicia faba* (this is the correct title, though they are sometimes called *Faba vulgaris*). Annual.

The culture of the broad bean goes back to prehistoric days in Egypt and Arabia, but the date of its introduction into this country is uncertain. We know that it was grown in Saxon times.

This vegetable needs rich, well-prepared ground. On light soils they yield an earlier crop, but on heavier soils they yield over a longer period.

Broad beans repay autumn sowing, and this may be done from October onwards. In the north and midlands, or on very cold soils, the middle of October is best. Middle to the end of November, or even December, in the south. It is only in cold, waterlogged soils that the seed rots in an autumn sowing.

This vegetable, even in the seedling stage, can withstand the severest frosts. Autumn-planted crops are very prolific, produce early, well-filled pods, and are in bearing before the green fly can do serious damage. Even in last summer's drought (1921), and on sandy soil, autumn-planted broad beans did splendidly. Where there are mice, dip the seeds in paraffin before sowing. The seed should be sown three inches deep and eight to nine inches apart. Some allow much less space, but overcrowding means poor pods and plenty of blight. Sow thus: . ˙ . ˙ . ˙ . ˙ . ˙ . in double rows. Allow two feet six inches between the double rows.

Plant each bean with the little black line, from which growth springs, resting on the soil. If planted "anyhow," the rows will be uneven and time will be wasted, for the seed must work itself into the right position for growth to start fairly.

Broad beans only retain their full germinating powers for one year. Do not plant the seeds with a dibber. If a dibber is used the beans often rest suspended half way down the hole, and can get no root hold. Make drills for the seeds three inches deep.

In a bleak district surround the seedlings with a little light litter. Holly boughs are good, but anything that lies cold and heavy on them will do more harm than good. Even on sandy soils autumn-sown broad beans should be slightly earthed up for protection. On very heavy soils, where autumn planting is inadvisable, raise the first sowing in a cold frame, harden off, and plant out early in April.

Protect the seedlings from slugs with rough coal-ashes liberally sprinkled along the rows. Keep the hoe going between the rows. Pinch out the tops when the first beans have set. Some old country gardeners syringe the blight, when it appears, with water in which elderberry leaves have been boiled.

One frequently hears of the advice to cut down the main stems of broad beans when they have finished bearing in order to encourage fresh shoots to spring up, but they do not yield sufficiently to make it worth while wasting valuable ground on them, and it only pays when room is no object whatever. Long pods are best for autumn sowing and early spring, and Windsor for spring sowing.

DWARF, KIDNEY, OR FRENCH BEANS. *Phaseolus vulgaris.* Annual. A native of southern Asia. Why these are now called French beans is uncertain. They were introduced into this country early in the sixteenth century by the Flemish immigrants. In Queen Elizabeth's day they were known as Roman and later as kidney beans.

Dwarf beans can do with a much lighter soil than runners. A warm, light loam, in an open position, that has been well worked and enriched with rotted manure will yield a splendid crop. It is almost useless to plant the seeds in heavy, wet clay, for they will rot away by the dozen.

Plant in six-inch pots, using freshly chopped turves and good soil, and provide good drainage. Sprinkle only a little soil over the seeds. Harden off carefully (this is important). Plant out when the first rough leaves have formed and when the weather is propitious in mid-May: in northern and cold districts a little later. If necessary, protect from cold winds with evergreen boughs. Sow out of doors from the middle of April to the middle of July. Plant three inches deep in double rows, allowing six inches between the seeds and two to three feet between the double rows.

Thin to one foot between the plants in the double rows, thus: . ˙ . ˙ . ˙ . ˙ . Keep the hoe going regularly, and pick the pods as soon as they are a fair size, otherwise the plants will cease to be productive.

It is a good plan to place slices of swedes here and there under the leaves of French beans as slugs, prefer this vegetable to any other. They attack the underside, and so can easily be found and destroyed and the swede replaced.

When dwarf beans have yielded a good crop, do not hesitate to remove them. If left in the ground they will go on yielding, but not enough to make it worth while. Chop up the roots and dig them into the ground as they are full of nitrogen.

French Beans in Pots. Use clean dry pots and ample clean drainage. After putting in a few crocks for drainage, half fill six-inch pots with loamy soil—chopped-up turves with a little ordinary soil would do splendidly—then plant ten beans in each pot at equal distances apart. Sprinkle a very little soil over the seed and keep them sparingly watered.

When the first rough leaves have formed, carefully draw out all but the best plant and fill up the pots with good fine soil to within an inch of the brims.

Give water from overhead with a fine rose-can until flowers appear. Then it must be stopped for the blossoms to set. As the pods fill (but not till then, or they will drop off), weak liquid manure may be given once a week with plain rain water between whiles. Gather the pods when a nice size, as the more they are picked the more they will produce. Guard against red spider by syringing the undersides of the leaves. Support the plants, if necessary, with a few short sticks or brushwood.

RUNNER BEANS. *Phaseolus multiflorus.* Half-hardy perennial, but treated as an annual. A native of Mexico and South America, and introduced into this country in the seventeenth century. (Runner bean roots, if kept free of frost through the winter, can be replanted, but the results are so poor that this is seldom done.) They like a rich deep soil, and are a greedy vegetable. For this reason they should not be near any other crop, especially any of the cabbage tribe, as they also want plenty of food, and it is a continual struggle between them to live. One sometimes sees cabbages planted at the base of scarlet runners. It is a splendid thing, without doubt—for the cabbages—for beans of all kinds are nitrogen gatherers, but the beans want to store the food for themselves. Cabbages exhaust the soil sooner than any other vegetable—bar none—and when they and beans are grown in close proximity the weaker plant, *i.e.*, the bean, will come off uncommonly badly.

Runner beans like a rich, well-dug soil, and to get the best results a trench should be dug three feet deep, the bottom spit and half the second being thoroughly incorporated with well-rotted manure. Rows not less than six feet apart are best. The custom of growing them along fences is a common one, but produces a very inferior crop to those grown in the open. If they must be grown along a fence, extra care should be taken to enrich the ground, and the seeds should be planted well away from the fence. Even then, the roots will probably not get sufficient moisture, as they need a great deal.

Scarlet runners revel in sunshine, and it is useless to hope for good results if they are grown even in part shade. On the other hand, they will grow in a concrete yard in boxes, provided they are in full sun. Stake the site for runner beans before planting them, instead of after. The stakes act as a shield, and there is no disturbance of the young roots. Beans must be very firmly staked, otherwise they make poor progress. Plant the seeds early in May, three inches deep and nine inches apart, and when planting, place the little mark on the beans downwards. Beans planted " anyhow " come up irregularly.

In dry weather scarlet runners must be liberally watered, otherwise they drop their buds. When in full bearing, liquid manure twice a week is helpful. Nip off all tops of runner beans overhanging their supports. No plant likes to flop about in the wind.

It is a serious mistake to feed scarlet runners (or, in fact, any plant which " sets " its fruit) before the pods have begun to swell. Giving them liquid manure before this stage will make them run almost entirely to leaf and produce few flowers. When in full bearing they like to be given liquid manure once a week, but this is quite unnecessary if the ground has previously been trenched and enriched. Contrary to the usual custom of climbers, scarlet runners " run " from left to right. Consequently, straggling shoots which have failed at first to find their supports, must be helped the right way. If twisted contrary to their natural way they make desperate efforts to right themselves

Runner beans will go on bearing into November if untouched by frost, so they are worth a little care to save them from early frosts. The slightest protection of netting, tiffany, or old curtains is a great help; or newspapers pinned together do just as well. Of course, these must all be removed next morning.

If all the beans are picked when of medium size there are few crops which go on yielding so long and so well, but if allowed to ripen a few pods they cease to become very productive.

Raising Seed in Boxes. When the soil abounds in insects a sowing should be made in boxes, but great care must be taken at planting time that the roots, which become very entwined, are not broken. They are of a fleshy brittle nature. The best plan is to soak a few at a time in water until the roots are free of soil and can be disentangled. After planting, give a good dusting of soot or lime round the beans. Slugs love them.

Scarlet Runners in Bush Form. In bleak, windy districts this is a better way of growing them than with the indifferent support of sticks or strings loosened by gales. In certain districts growers never stick their beans, and the average crop is 5 lb. a plant. The beans are grown for market, and if this were an unprofitable method it would not be pursued. They should be slightly earthed up, so that any rain may fall into the little trenches and quickly reach their roots. The hoe should be kept at work in the centre of the rows. All straggling tips should be kept close so that each plant stands out compact for the sun and air to reach. Unless this is done, beans grown in this way will not be a great success.

Don't give up the idea of growing beans because you cannot find space for a whole row. Four beds of them about a yard square, with the sticks planted wigwam fashion, will give a crop of about 40 lb. if planted in well-dug ground.

Bean Aphis. Commonly known as black fly. Pinch out all tops as soon as this makes its first appearance, and burn them. If left on the ground the flies return to the beans.

Bean Pod Canker. This fungus is distinguishable by dark patches edged with red. It attacks the pods of French and runner beans. It is difficult to deal satisfactorily with this disease unless it is noticed in the early stages (when it attacks the stems and leaves). Burn all affected plants, removing them carefully to avoid infection. Spray the crop with Bordeaux mixture at half strength. Inferior seed often introduces this disease. Hence the importance of buying seed from a first-rate firm.

Red Spider. Common in hot dry summers when dwarf and runner beans in light soils, or near fences, are very apt to suffer from it. The damage done to the leaves checks the production of pods. Dwarf and runner beans grown in well-trenched ground where they have sufficient moisture seldom suffer. Where red spider is prevalent, give the plants a good soaking and mulch them. Syringe the stems and foliage.

BEET

BEET. *Beta vulgaris.* So called because when the seed pods swell they resemble the Greek letter *beta* (β).

The plant is a native of south Europe. For ordinary table use medium-sized roots should be grown. Care should be taken in the choice of beet seeds, as some varieties are poor.

The majority of root crops detest fresh manure, and good beet will not grow where there is a trace of it; it will canker and be worthless. Ground in which cauliflowers or celery has been grown is ideal for beet, for either of these crops will have taken the manure put in the ground for their own benefit. Failing this, choose a light piece of ground and work in any well-rotted stuff from an old cucumber bed. If you live by the sea, fill up the bottom of the trenches with a thick layer of seaweed. On light ground a moderate dressing of salt is good as beet is a seaside plant, but do not apply salt to the ground unless it is light and dry. Salt on wet sticky soil makes it damper than it was before.

Trench the ground two spits if the soil will allow it, but nothing is gained by delving into unfertile sub-soil. If only the top spit is workable, choose the round globe varieties.

It is best to make the beds about four feet square so that they can be easily hoed and weeded without bruising the leaves. Sow beet in drills one-and-a-half inches deep and in rows one-and-a-half feet apart.

The main crop of beets should not be sown till April, though in the south it is quite a good plan to risk a sowing at the end of March.

Beet seed is large enough to handle without waste. Drop in two every five or six inches along the drills, which should be from sixteen to eighteen inches apart. As the tiny red leaves appear above the soil, remove one seedling from every pair that germinates. Press the remaining plant very carefully back if it has been disturbed. After a few weeks every alternate plant will be large enough to cook or for salads, etc., and this will leave room for the remaining crop to develop.

Beet that is in a backward condition owing to prolonged drought can be helped on by a light dressing of nitrate of soda sprinkled along the rows after giving the plants their final thinning. Lift the foliage as you work so that the nitrate falls directly on the ground; it will burn and disfigure greenery.

Beet is fond of salt, but do not apply it in hot weather. When it is dull and looks like rain, sprinkle a little salt along the rows and fork it in after the rain has fallen. Where beet is planted on heavy ground it is better to apply lime some time before the seed is sown than to use salt. A poor beet crop is frequently due to the fact that it has been too deeply planted. One-and-a-half inches is quite enough. Beets like half sitting on the soil so that they can enjoy the sun and air. Look at fields of beet grown for market.

Small, globe-rooted beetroot sown in the middle of August will stand the winter. Beet should be lifted as soon as the roots are the desired size. Those lifted in July or August keep just as well as those lifted in October. They must, in any case, be lifted before there is any frost. Lift with the greatest care and twist, not cut, off the leaves before storing.

On very heavy soil it is a good plan to adopt a modified form of the boring process used for growing beet for exhibition. Bore the holes (a foot apart) with an iron bar, twisting it round in wide circles. Then fill up the holes with a compost made up of old potting soil, wood ashes, and leaf mould in equal quantities, rubbed through a sieve. Sow a few seeds at the top of each hole and remove all the seedlings except the strongest.

In some districts beet are almost cleared by the attacks of birds. Curiously enough, they do not attack the turnip-rooted varieties. Other varieties are only attacked in the seedling stage, and they should be protected by fish netting, bird scarers, etc. Some growers find scattering ashes from a blacksmith's forge along the rows most effectual in keeping off the birds.

Beet Fly. Its ravages are distinguishable by blotches on the leaves, and as the leaves shrivel the roots suffer badly. Pick all the affected leaves and dig up badly affected plants and burn them immediately. Give a light dressing of nitrate of soda to encourage luxuriant new leaf growth. Thistles and docks are also attacked by this fly and therefore they must be kept down vigorously.

Beet Rust. Distinguishable by the red spores on the leaves. Spray frequently with Bordeaux mixture. Burn all diseased leaves when the crop is lifted.

BORECOLE OR KALE

Borecole or Kale. *Brassica oleracea acephala.* Biennial. Probably a selection from the wild cabbage. Borecoles will succeed on any soil from the lightest to the heaviest, but it must be well dug. Considering their hardiness, the continuous crop (if carefully picked) which they give, and the fact that they provide a large supply of greens in the early winter months when vegetables are scarce and expensive, they are the most valuable greens in a small garden.

It is a mistake to sow the seeds before April, or the plants are apt to flower and run to seed. Sow the seeds during the first week in April. They must be protected from birds, for these attack kale in the seedling stage even more than other seedlings of the brassica tribe.

Plant out as soon as possible in their permanent quarters, giving two feet six inches to three feet apart each way. Keep the ground well hoed between the plants.

Club root is common amongst borecole, and signs of this serious disease should be looked for in transplanting seedlings.

Curled kale should have its leaves picked singly from the base of the plant, leaving the tops to encourage further growth. The old cottager's kale is still one of the best: asparagus kale is not very satisfactory. Variegated kale is well worth growing, if only for its beauty; and the young, exquisitely coloured leaves are a decorative addition to a winter salad.

BROCCOLI

BROCCOLI. *Brassica oleracea botrytis asparagoides.* Introduced into this country, probably from Italy, in the eighteenth century. It is generally assumed that broccoli are a hardier form of cauliflower.

Broccoli like rather a heavy loam well manured, but containing no rank manure. In loose soil the heads are badly shaped and open. Those to stand the winter should be in firm, but not too rich, soil.

Sow the seeds in drills a foot apart from the middle of March to the middle of May, according to the variety. Those intended for autumn cutting must be sown in the middle of March; for winter and spring cutting in April, and for summer in the middle of May.

As with all greens, early thinning of the seedlings is essential, and if this is neglected the result will be poor heads. Short, sturdy seedlings are what one wants, so give them three inches apart when moving them from the seed to the nursery bed. For final planting, give two feet six inches each way between the plants.

When transplanting broccoli or other greens a good piece of the long tap root should be cut off. These tap roots are singularly tough, and should be cut with a very sharp knife. This is important because jags often set up disease.

It is a common practice to break the mid rib of a large leaf over the heads when they are forming to protect them. In very severe weather it is a good plan to scatter a little light litter over the heads. In small gardens it is rather wasteful to grow broccoli for spring and summer use, as they occupy the ground so long, and those for early spring use are frequently a failure in our variable climate. It would be better to give the space to kale and sprouting broccoli.

SPROUTING BROCCOLI. It does not pay to grow sprouting broccoli unless they can spread themselves about. Given plenty of room they are the most profitable greens we have. The shoots should be cut with care. Cut them towards the centre stem, and not towards the big outside leaves. When the shoots are cut outwards one is so apt to carry the knife through the stems of the big leaves which protect the tender shoots.

Leaves that are not edible are not useless. Nature knows her business and placed them there for protection. In the case of broccoli, kales, etc., they shield the edible part of the plant from severe frosts, heavy rains, and winds. Only leaves that show signs of decay should be interfered with.

Do not strip one plant for a boiling of greens, but pick one or two shoots from each. New shoots are then rapidly produced. The side shoots should be picked, leaving the head intact.

Where there is little room for broccoli, choose purple sprouting broccoli, as they are the most profitable. There are early and late varieties which will give a supply from January to May.

BRUSSELS SPROUTS

Brussels Sprouts. *Brassica oleracea bullata gemmifera*. Biennial. Originated in Belgium, and introduced into this country in the nineteenth century. Brussels sprouts were grown for about two hundred years in Belgium before they were introduced into this country. To obtain really good brussels sprouts, the most delicate of winter greens, one must leave nothing to chance. Those tall, straight stems, almost a yard high, thickly covered with firm, compact buttons, are the result of sowing seeds as early as possible (they like a long period of growth) and planting in firm ground that has been well manured. It is customary to make the first sowing in gentle heat the first week in March, but the finest plants are obtained by sowing out of doors in early autumn or at the end of August. These seedlings, if well thinned out and given a very slight protection with litter during severe frost, make splendid plants. For a successional crop, sow out of doors in April.

Brussels sprouts should be taken from the seed bed just as soon as they are big enough to handle. They suffer more than most greens if left huddled in the seed bed. They should be planted thirty inches to three feet apart. They do well between the rows of short-topped potatoes, but should not be planted in such a position until the final earthing-up of the potatoes has been done.

In taking brussels sprouts from the seed bed be extra careful to keep as much soil as possible round the roots, and get them into position as quickly as possible. They take longer to recover from root disturbance than any other greens. As with all plants carelessness in exposing the roots of seedlings to strong sunlight, even for a short time, throws the plant back for weeks.

When well established they like frequent little stimulants in the way of sprinklings of some complete fertilizer. Firm soil round these greens is most important. Greens planted in loose soil take weeks to establish themselves.

Very rampant growth on brussels sprouts is a bad sign, as it means the buttons will be loose. Do not feed such plants, and it is a good thing to remove some of the lowest and largest leaves.

In picking brussels sprouts take the lower buttons first: they should be snapped off, not cut, and new growths will appear. Remove any coarse leaves shading the higher sprouts. Do not use the little cabbage heads until the stems are bare of buttons. They act as a protection, and cutting them also upsets the flow of sap. The cabbage heads of brussels sprouts should never be removed until the last button has been severed from it. These heads seem to act as a restraining mother to the little sprouts, for as soon as they are removed the sprouts behave anyhow, opening out from firm buttons into almost useless spreading leaves, and yellowing off very quickly. Always keep the brussels sprouts bed clear of decaying and dead leaves.

CABBAGE

Cabbage. *Brassica oleracea.* Biennial. Indigenous plant. The spring cabbages are the most important. These should be given the best and sunniest position, otherwise they will not come in until the peas and beans are ready, when they are not so much needed. The seed should be sown in the middle of July, with another sowing in the middle of August in the north, and in the first week in August and last week in August in the south. If seed is sown too early, the plants are very likely to bolt in the spring, instead of forming heads. Sow in drills nine inches apart, and protect from birds.

Cabbages must be planted out in firm soil, or they will make loose, poor heads. Plant out eighteen inches to two feet apart. For successional crops sow from March onwards. Cabbages like rich, well-dug, firm soil, but cabbages to stand the winter are better without manure. They make growth too quickly in rich soil and the stems are often sappy. This is not wanted. A perfect spring cabbage must be of slow growth during the autumn, with a hard stump that will stand several degrees of frost and come up smiling. Feed in spring with liquid manure.

If possible, plant out spring cabbages where they can have the benefit of a south wall or fence. You get quick results by so doing, as the plants are guarded from cutting winds. It is *early* spring cabbages that are wanted, so give them the best place you can. In planting out cabbages and other greens beware of firming the plants round the base of the stems and leaving the roots loosely planted.

Cabbages, savoys, etc., raised in clean ground, may be planted with a ball of soil round their roots.

Bought plants should have the soil washed from the roots in case of club root. Seedlings with club root should be burnt. Before planting seedling greens of any kind dip them in a soft " mulch " of sooty water (made with soot at least ten days old) and earth. All bought plants of cabbages, cauliflowers, and other greens should have every bit of soil washed from their roots before planting out to get rid of possible club-root maggots.

In planting out cabbage seedlings, or seedlings of any other greens, if the seedlings vary in size, plant them on the same level underground, and let the difference between them be on the surface. Look well after cabbage seedlings to check slugs and birds; the latter will often pull the tiny plants right out of the ground. Dust them with spent soot and lime.

Cabbage Stumps. Properly managed, cabbage stumps yield a valuable crop. Leave a few of the lower leaves, and give the ground a good dressing of soot, or soot and salt mixed, and where there is sea-weed in reach, use that. Always fork over the surface before giving the dressing, and apply it after rain if possible. Very often the second and third crops of greens from the old stumps are nicer than the original close-grown cabbage. They are so very tender. Hoe round these stumps now and then, and give a sprinkling of nitrate of soda. It will materially assist them to throw out young shoots.

All vegetable growers know that although a row of greens may be planted out at the same time they differ tremendously in development, so that one cannot cut from cabbage to cabbage in the methodical way one would like, so to avoid untidiness old stumps are often pulled up that would yield again and again if left in the soil. Lift such stumps carefully and re-plant them quickly and fairly closely in any odd corner, giving the roots a thorough good soaking when planting. They will settle in quite happily, and you will be able to gather from them as convenient. Every now and then sprinkle round the stumps with a light dressing of nitrate of soda. They will well repay this little extra trouble. Cabbage stumps carefully picked will yield all through a fairly mild winter, but the stumps must be fed.

If you want to have really clean green vegetables you should not raise them where there are many sweet-smelling flowers and flowering shrubs. Where privet hedges are allowed to bloom the common white butterfly, who is responsible for the caterpillar that so devastates all greens, will hover in great numbers and lay eggs on the surrounding vegetation. Caterpillars are voracious eaters, and if left undisturbed will soon destroy a whole crop. Hand pick them and water them with water in which lettuce stumps and leaves have been boiled (see page 156). Slugs, too, are very partial to young greens, and rather coarse cinders should be placed round the roots to keep them at bay.

To Store Cabbages. If the cabbage bed is urgently needed and there are still cabbages left, treat them in the following way:

Make a trench as for celery, then lift the cabbages and bury them, roots uppermost, covering them in with the removed soil and leaving it in a ridge—not level. A few of the outside leaves will decay, but the hearts will remain in perfect condition for weeks, to be used as required.

Country people often run a hole right through the stems of cabbages just under the leaves when they look like bolting instead of hearting-up. This certainly stops the flow of sap in an upward direction, but such plants are never so fine as those which behave themselves from the first.

Cabbage Butterflies. To prevent them laying their eggs on cabbages the following is an excellent plan: Tie pieces of naphthaline, about the size of a lump of sugar, in pieces of muslin, and hang them upon strings so as to swing over the cabbages about a yard apart. The smell keeps the butterflies off. (It is also a good preventive for the beetle in raspberries and the leaf-cutting bee in roses.) Another method is to get some thin stakes or laths of wood, about three feet six inches long, tie a piece of lump brimstone (two inches long) on top, like a sky-rocket, and stick in the ground one at each alternate row and one in the middle.

The cabbage moth caterpillar is easily the most voracious known: the moths are brown with pink markings.

The caterpillar of three varieties of butterflies attack the cabbage tube—the large white, the small white, and the green veined; also the caterpillar of the cabbage moth.

Slugs. To protect young cabbages from slugs it is a good plan to place a lettuce plant or two among them, as slugs will always eat a lettuce in preference to a cabbage.

Wild cabbages growing on the seashore, from which our cultivated cabbages, cauliflowers, etc., have sprung, are seldom attacked by insects because they are impregnated with salt. All insects detest salt. Failing handpicking, the best way of getting rid of caterpillars is to spray them with common or agricultural salt and water. It should be sprayed under and over the leaves, and the ground where the cabbages grow should be sprinkled with salt, whether there be few or many insects. If using common salt, crush it fine before applying.

When cabbages or other greens droop and look lifeless, it is almost certain that there are insects at work, and the plants should be taken up and inspected for those malformations which indicate clubroot, but do not fill up the gaps with healthy plants, or it is more than likely that they will be affected. The vacant ground should be dressed with lime, and the healthy plants given a stimulant in the way of a mild sprinkling of nitrate of soda along the rows.

Where the ravages of insect pests threaten to be serious some growers use little cardboard discs with a slit in them, dip them in paraffin, and slip them on to the stems of the healthy cabbages at the base.

Remove decaying leaves from cabbages, as anything of a decaying nature is a happy home for insects.

White Fly. These settle on the undersides of the leaves, and their presence may be suspected when the lower leaves look unhealthy and turn yellow. The only satisfactory method of dealing with this pest is to destroy infested leaves.

Cabbage Aphis. This aphis, which attacks all members of the brassica tribe, is greenish in colour. It is the most difficult of all aphis to deal with, owing to its waxy covering. In a time of drought, when this aphis becomes very prevalent, spray, if possible, with paraffin emulsion. If the crops are too nearly mature for this, it is scarcely possible to do anything except syringe as frequently as possible with clear water.

Cabbage Root Fly. This fly is rather smaller than the ordinary fly. The maggots attack the roots of all members of the cabbage tribe, and also cruciferous weeds. Plants so attacked have shrivelled leaves, and rot at the stem. Fortunately, this pest is not common, for it is most difficult to cope with. Burn affected plants immediately. In cases where the pest is serious it is essential to gas lime the ground and to grow nothing of the brassica tribe on it for at least one season.

Cabbage Root Gall Weevils. These cause small swellings or galls on the roots of cabbages and other members of the brassica tribe. If these swellings are cut the grubs of the weevils will be found. Burn all infested roots immediately. Strictly speaking, the ground should be gas limed, but one of the good soil fumigants is often quite effective.

It is always a sound plan to dip the roots of all seedlings of the brassica tribe in a puddle of soot and lime before planting.

Black Rot. This disease attacks all members of the cruciferae tribe and causes them to rot away entirely. This is a most serious (but rare) disease, and all affected plants must be burnt and the ground dressed with gas lime.

Clubroot. Where soil is deficient in lime this disease is very common, and it is more prevalent on light than on heavy soils. The characteristic malformation of the roots is commonly known as " fingers and toes." Burn all affected plants and all the cruciferous weeds in the bed (shepherd's purse, for instance), dress the ground with lime, and avoid carrying infection by tramping from the bed on to others, as this will spread the disease. It is one of the most contagious diseases, and ground on which diseased plants have been grown should not be cropped with any member of the brassica tribe for at least two seasons. During this time shepherd's purse and all other cruciferous weeds must be rigorously kept down.

CARDOONS

CARDOONS. *Cynara Cardunculus.* Perennial. A native of southern Europe, and introduced into this country in the seventeenth century.

It is useless to grow cardoons unless they can be given all the attention they require. The only satisfactory way is to grow them in trenches as for celery. Trench two feet deep and incorporate well-rotted manure in the bottom spit.

Sow the seed in April on fine soil sifted on to this bottom spit. Plant the seed one-and-a-half inches deep, and water in a dry spell. Thin the seedlings to twenty inches apart. In cold districts seed must be planted under glass and put out at the end of May.

Cardoons need an abundant supply of moisture and, once a week, liquid manure.

Blanching begins in September, and should be done after a spell of dry weather. Tie round brown paper collars; protect these with hay bands (both are essential if clean stems are desired) and then earth up. Continue at intervals of a week to ten days till the plants are quite earthed up. Blanching takes about a month. Protect the foliage in case of early frost with any light litter.

CARROTS

CARROTS. *Daucus carotus.* Biennial. Indigenous plant. The cultivated varieties were well known amongst the ancient Greeks and Romans. The best carrots were those grown in Candia, and in connection with this it is interesting to remember that Gerard, in his herbal, speaks of the "Candie" or Cretan carrot.

The cultivated varieties were in use in England in Elizabeth's day, but only to a very limited extent. They became common when the Flemish immigrants taught us to appreciate them. In England we only grow red carrots, but on the continent they grow purple, white, and yellow varieties.

Sow in drills one foot apart, cover very lightly with soil, and thin as soon as the second leaves appear. Thin carefully, as carrots resent root disturbance. Keep the ground well hoed.

Carrots are often a failure because the seed is sown after a mere surface soil preparation, the result being that the under soil is full of all sorts of grubs and their larvae well hidden away from the birds, and these grubs naturally attack the delicious young carrot roots. The carrot fly will also deposit its eggs round the crowns of plants in badly prepared ground.

Ground for carrots must be thoroughly dug over several times, and it is as well to work in some good insecticide so that wireworm and the dreaded carrot fly may be kept away.

Fresh manure should not be added, but the plot should be in good heart from some previous gross feeding crop.

If possible, place seaweed in the bottom spit of ground prepared for carrots, but if this is unobtainable, give a dressing of basic slag to the top spit. Incorporate soot liberally to keep the carrot fly at bay the following season.

Carrot seed retains its germinating powers for four years, but if the seedlings do not appear within three weeks fresh seed should be obtained from another source.

For the first sowing in a warm border in January cover the bed with matting or muslin, or anything light, if frost threatens. The surface of beds for early sowings should always be prepared with wood-ash or anything of a light sandy nature. The seed should be not only very lightly covered, but the soil should also be fine, as the seed leaves of carrots are more fragile than those of most vegetables, and cannot force their way through hard lumps of earth.

When sowing carrots it is a good plan to mix the seed with radish seed and sow both together. The radish germinates quickly, and can be pulled when ready for eating, and considerably less thinning-out is required for the carrots. Many old country gardeners say that if a few onion seeds are sown with carrot seeds, they will, when they have germinated, keep the carrot fly away; and that if carrot is sown amongst the onions it will keep the onion fly at bay. This has not been scientifically proved, but there is usually a great deal of truth in these old sayings.

Correct artificials and quantities for carrots at the time of sowing are ¾ lb. of kainit, 1 lb. of sulphate of ammonia, and 2½ lb. guano, well mixed, applied to each square rod (30¼ square yards).

On heavy soils it is always worth adopting the boring process for carrots. Make the holes with an iron bar, twisting it round in a circular fashion; fill the holes with a good compost of old potting material, sand, wood-ash, and leaf-mould, and sow a few seeds on top of each. When large enough thin, leaving one seedling in each hole.

If sown in succession carrots may be pulled straight from the ground nearly all the year round. Those sown in July, for example, may be pulled in January. This July sowing is almost invariably profitable, for the chances are that there will be no really severe weather till the turn of the year. The middle of August is not too late to make the last sowing of short-horn carrots for autumn use. In all but the most southern counties sowings of carrots to stand the winter should be made in the middle of August.

This crop has to be sown with discretion, for if sown too early the seed will germinate too quickly in warm counties, and the plants are very apt to bolt the following spring.

After thinning, guard against leaving the soil loose round the plants. Unless all is firm the carrot fly will lay its eggs just below the surface soil.

Carrots which are slow in making progress, as frequently happens after a long drought, can be helped by a light dressing of nitrate of soda along the rows after the final thinning has been made. The nitrate must not come in contact with the foliage.

Lifting. Carrots should never be pulled up by the leaves. They should be carefully dug up with a fork. For storing they must be trimmed close to the crown. Rub them free of all soil, as the earth left on carrots often contains insects. Carrots are not frost-proof, but they recover themselves better than many frost-bitten vegetables, only eating a little sweeter than usual.

The carrot fly is easily recognizable by its intensely dark green colour. Its eggs, when hatched, live upon the root of the carrot, causing it to rot. If some carrot leaves turn yellow early in the season it is almost certain to be due to the carrot fly. Take up affected roots immediately. The best thing is to keep the hoe going between the rows so that the birds can get the exposed grubs. Many gardeners use a paraffin emulsion for this pest, but carrots frequently taste of this remedy, so that it is worse than the disease. Tobacco ash is an excellent insecticide for green fly, as it is effectual without injuring the young leaves. Where the carrot fly is suspected, sand, sprinkled with paraffin, should be scattered between the rows. Late-sown carrots are very often attacked by green fly. Examine the foliage, and if the fly is present, dust freely with old soot or spray the bed with quassia chips and soft soap.

CAULIFLOWERS

CAULIFLOWERS. *Brassica oleracea botrytis cauliflora.* Biennial. The origin of cauliflowers is unknown, but probably they came from Italy. They were introduced into this country in the sixteenth century.

Sow the seed in drills one inch deep and nine inches apart. Thin out the seedlings early to four inches apart. The old system of sowing seed in August or in the beginning of September for early cauliflowers is now generally abandoned in favour of raising quickly-maturing varieties in heat in early spring; but the latter never make such fine plants as autumn-sown seedlings.

The autumn sowing of cauliflower seed should be made in a cold frame at the end of August or early in September. The seedlings should be thinned out to four inches apart each way. To leave them closer "to protect each other through the winter" is an exploded idea. It merely makes sickly plants. Properly thinned out plants become very sturdy. They don't need coddling, and the more they are exposed to sun and air the better for them. Keep them near the lights or they will become drawn. Keep the lights off the frame in all but exceptionally bitter weather. It is their *stems* that are delicate, and these will get all the protection they need from the sides of the frame. Cauliflowers will stand quite a lot of frost if brought up to bear the cold weather by degrees: this is specially the case if the air is pure.

Some gardeners contend that, except in the bleakest districts, it is best to sow cauliflowers in the open rather than in a cold frame. Put them on a raised bed so that they will be free from excessive damp, and to give them protection place turves round the seedling plot. It is only mismanaged plants which suffer from frost, *i.e.*, those brought up in the greenhouse and then suddenly planted out in the open.

In making a sowing of cauliflowers for the spring choose a piece of ground that has not carried any of the brassica tribe for some time, as all the brassicas take an enormous toll from the soil. Ground that has been cleared of summer spinach is ideal if not too exposed.

Plant out young cauliflowers very firmly. Anything that will develop a big head must be extra firm about the roots. Newly planted-out cauliflowers should have attention if the weather is dry. They will have big heads to carry, and if they are checked by drought they often refuse to pick up again. Surface watering is worse than useless: they must be thoroughly soaked. If mulched, be careful not to let the mulch touch the stems.

Cauliflowers should be planted in shallow trenches: there is no better way to obtain good results. Do not attempt to grow cauliflowers unless you can afford to give them ample room when they are to be planted out. Thirty to thirty-six inches apart each way is none too much for them. They also occupy the ground a long time, so in a small garden it is always questionable whether they will be a profitable crop.

Cauliflowers that are showing hearts should have one leaf brought over the flower. If it will not stay in position snap it, but do not quite break it. The leaf will protect the white heart from blacks and bad weather. Cauliflowers and broccoli often come to perfection too many at a time. If a few leaves are broken over the heads to prevent the strong sunshine drawing them, they will last compact for some time. Another way to spread them over a certain period is to lift a number with some soil attached and "heel" them in a north border. To heel a plant is to pick it up with a good ball of soil and lay it in a trench, well covering the roots with soil, and leave it until wanted.

When cutting cauliflowers leave a small piece of the flower on the stem, and fresh growths will be thrown out. For cutting in September sow the seed during the first week in April in the open.

Forcing Cauliflowers in Pots. Choose seeds of a good forcing variety, and sow in gentle heat in shallow boxes during December or January. Prick out as soon as large enough to handle and keep near the glass to prevent the seedlings getting drawn. The important thing at this stage is to plant them right up to the leaves and plant them very firmly. Don't overcoddle them or they will not be sturdy.

Transplant into six-inch pots and again plant them right up to the leaves and very firmly. Finally, transplant into nine-inch pots in a compost of three parts good loam and one part well-rotted stable manure. Put some fibrous loam over the drainage, as cauliflowers like something firm to cling to. Don't fill the pots up with soil, as cauliflowers are moisture loving. When the pots are filled with roots liquid manure must be given. They appreciate overhead watering, as well as plenty at the roots. Give plenty of air whenever possible.

CELERIAC

CELERIAC. *Apium graveolens rapaceum.* Biennial. This vegetable is more grown and appreciated on the continent than in this country, and unless it can have the cultivation it needs, *i.e.*, rich ground, plenty of water, and a long season of growth, it is not worth wasting space on it.

Plant the seeds and treat the seedlings exactly the same as main crop celery. Plant out in May, and before planting out cut off all lateral growths. Plant them as shallow as possible in rows fifteen inches apart, and two feet between the rows.

Moisture is of the greatest importance—it is almost impossible to give too much—or the roots will be tough. Old leaves and lateral shoots must always be removed.

Celeriac should be given special attention in early September, as at this season we are very apt to get slight frosts just before dawn, and celeriac comes to grief if unprotected. Draw up the soil well over the roots of celeriac, and as the nights become colder cover them with a litter of straw, moss, or bracken.

Lift early in November and store in boxes filled with fine soil or sand, but the boxes should be kept in a cool place, or growth will start. Lift before the real frosts begin, and before storing cut off all the leaves except the centre ones.

CELERY

CELERY. *Apium graveolens.* Biennial. Indigenous plant, but the origin of the garden variety is unknown. Ciche is the old English name for celery. It began to be commonly grown in the latter part of the eighteenth century.

Celery is one of the few vegetables that cannot be grown too large, and it repays all the labour that can be bestowed on it. It should be remembered that celery grows naturally in swampy places and at the bottom of ditches, and it is of the greatest importance to give it abundance of moisture always. The soil, however, must be well drained, as celery will not thrive in waterlogged soil. If the seedlings lack sufficient moisture at any time the results will be poor, and the stems will very likely be hollow.

Do not sow before the first week in February, or the plants will probably " bolt." Overcrowding the seedlings and too great heat are both fatal mistakes. The temperature should be between 55 and 60 degrees.

Celery seed retains its vitality about eight years. It germinates in about three weeks.

The first batch of celery seedlings should be planted out in a shady sheltered bed in May, to remain until wanted for planting in trenches. Celery seedlings must be hardened off by degrees unless they have been raised in a cold frame, and even then they must be sheltered in the open. If they have been raised in heat under glass bring the seedlings first into a cold frame, and after a few weeks plant them in the open, in the most sheltered spot you can manage; and in the meantime prepare the celery trenches to be ready the last week in May or the first week in June. Nothing is gained by putting out celery too early. Choose a moist position if possible, and have the trenches running from north to south. For single rows of plants there should be four feet between the rows. The trenches should be ten inches deep and eighteen inches wide at the bottom. Experts vary greatly as to distance apart to plant celery—from six to fifteen inches. It is not a bad plan to split the difference unless one has some definite reason for taking one of the two extremes.

It should be noted that market gardeners do not plant celery in deep trenches as a rule. When the final earthing-up is done the roots are above the bottom of the furrow between the ridges. If below this level the crop would suffer badly in a wet season.

At the bottom of the trench place fairly fresh horse, cow, or pig manure, and over this four inches of good soil.

Celery is a very gross feeder, and by the time the rootlets are through the surface soil they will be able to take the coarser food. It is waste of time to grow this vegetable on ground that has not been well manured.

Although celery is a gross feeder, it likes its food to be sweet and the soil to be well drained. Celery can never be planted in too rich soil. Much that is grown for exhibition and for sale is cultivated in manure that has very little loam in it. If the weather is dry give water after planting and shade from the sun for a week or so. Celery should be at least a foot high before the first earthing-up takes place, as this process is to blanch and protect it, and, in a measure, it stops growth.

Earth-up with care, for the young leaves of celery are very easily injured. If there are any little side shoots on the plant remove them; if left on there will not be good hearts. If there is time arrange the soil with a trowel in the first earthing-up; and the second, which should take place a fortnight afterwards, may be done with a fork or spade. In the second earthing-up let the tops of the leaves next to those on the outside of the plant show above the soil, and in the third operation, which must be done ten days or so from the second, only the tips of any greenery should be seen. The secret of making a good earthing-up of celery is to have the entire plant hidden in perfect darkness without the soil being so compressed that they feel the restraint.

It is becoming more and more the custom to grow celery on the " collar " system, and it is a good plan if carried out properly. Otherwise it is best to stick to the old-fashioned way of earthing-up with soil. The collars should entirely cover the stems of the plants, and when they outgrow their collars these should be replaced with larger ones.

To Blanch with Brown Paper. This is labour saving, but it is questionable whether the results are better than the ordinary method of earthing-up. One point in its favour is that it is very easy to water the roots without interfering with the leaves. The bands must be of brown paper, not too stiff. They can be cut into strips five or six inches wide, and from ten to twelve inches long. The plant must be handled just as if you were earthing-up, taking the leaves in the left hand and winding the bands very lightly round with the right, and keeping them in place with bass or thin string. Very thin bass is the best thing to use because it will snap as the plants expand, and thus save the necessity of untying when the bands have to be loosened.

Keep the first band as near the base of the plant as possible, and add a second and third band at the same intervals as you would do the job of earthing-up, which is every two to three weeks. In placing on a fresh band see that it slightly covers the previous one so that every particle of light is excluded.

In blanching celery with brown paper collars avoid the mistake of earthing-up slightly as well. The soil rots the paper, and the celery will be more or less decayed. Many French gardeners never touch their celery leaves with soil. They mass clean straw round it, first tying the plants lightly together in three places, near the base, round the middle, and just under the greenery of the leaves. Celery blanched in this way is clean and dry. Many people living by the sea place a board on both sides of the celery row and fill up the space with sand from the shore. Celery blanched with sea sand is delicious—the salt in the sand agrees with it. River sand must never be used; it may contain oxide of iron, which is unsuitable for this vegetable.

A quick way to Earth-up Celery. Place a stake at each end of the celery trench. Fasten a thick string to one stake, and beginning with the first root of celery make a loop of string round each shoot and fasten the string to the other stake. Earth-up, and you will find the job has been done in a quarter of the usual time, and in a much easier way.

Celery should be watered with salt and water once a week. A piece of salt the size of a walnut to a gallon of water is the right proportion.

Seaweed is a splendid mulching material for celery. Too much strong liquid manure will cause hollow leaves. Celery grown in very heavy soil will also be affected in this way, and such stuff is no good except for flavouring soups.

Celery may be greatly protected against heavy rains by nailing two thin pieces of wood lightly together so that they form a V, only upside down. Place this along the ridge. Pieces of strong bent cardboard will do just as well.

Those who like the flavour of celery should dry off some of the more delicate greenery in the same way that parsley is dried. Hang it up in a warm place, tied loosely in muslin to keep off the dust, till perfectly dry, rub to a powder, and store in a clean dry tin, kept in a dry cupboard. In France the extreme tips of the inner growth of celery are often chopped finely and used for sauce, as we use parsley. They also do duty as a garnish for cold meats, butter, etc. In no case would a French cook throw such dainty morsels away. If she had no better use for them they would go to help flavour soup.

Celery Fly. This is a brown fly with dark yellow legs. It lays its eggs on the leaves, and the ravages of the grubs check the growth of the plant. In serious cases the celery is stunted in growth and has a peculiarly bitter flavour.

Pick off all infested leaves and burn immediately. Spray with paraffin emulsion (this is most effective) or dust with soot or lime. Always keep a look-out for this pest, and it is best to adopt preventive measures (*i.e.*, spraying with paraffin emulsion), as dealing with the pest is a tiresome job.

Celery Leaf Diseases. Distinguishable by small yellow spots or brown spots (with black points) on the leaves. Celery seedlings with black spots should always be burnt. Spray frequently with Bordeaux mixture at half strength. Celery grown in well-cultivated ground is seldom attacked.

CHICORY

CHICORY. *Cichorium intybus.* Hardy perennial. Native plant, but little cultivated in this country. Extensively cultivated on the continent.

Sow the seed in May in rows one foot apart, and thin to nine inches apart. In November lift the roots carefully with a fork, cut off the foliage, and place closely together in boxes. Cover with fine soil up to the crown. Place in the dark in a cool shed or cellar and keep moderately damp. The growth in perfect darkness is very rapid, especially if a box is inverted over the box containing the roots. By bringing in supplies as they are needed a supply may be maintained till May.

COLEWORTS OR COLLARDS

Coleworts or Collards. A variety of cabbage, the chief characteristics being hardiness and quick maturing. Treat exactly the same as cabbages, but in planting out leave only one foot between the plants each way.

Coleworts are a valuable catch-crop, and it is a pity more use is not made of them in small gardens. Seed may be sown in March, April, and May, but it is customary to sow in July and to plant out early in September. They will be ready in November.

COUVE TRONCHUDA

Couve Tronchuda. *Brassica oleracea oblonga.* Biennial. A native of Portugal, and introduced into this country a hundred years ago.

Sow in March, and treat exactly the same as for cabbages, but the plants must have at least three feet each way between them. The mid-ribs are delicious; the outer leaves make good "greens" for boiling, and, finally, the heart is eaten. It is essential to give couve tronchuda a bountiful supply of moisture and liquid manure occasionally.

CUCUMBERS

CUCUMBER. *Cucumis sativus.* A native of north-west India, and introduced into this country towards the end of the sixteenth century.

The cucumber is a very ancient cultivated vegetable, and was widely grown in India, China, and Egypt for many thousands of years.

Cucumbers grow best on conical mounds of good turfy loam, kept in place with old slates, arranged on the glasshouse staging. Either sow a couple of seeds in each mound, or plant a single plant. The compost for the plants may be two parts decayed turfy loam and one part partly decomposed manure. Some well mix the two; others again put the manure at the bottom and plant the seedlings in the loam. Stations built up along a greenhouse staging must be firmly arranged.

Or seed may be sown from January onwards in a light, sandy compost, half an inch deep, singly, in three-inch pots, with good drainage. An ideal compost for the seedlings is fibrous warm leaf mould and sand. Place on bottom heat. Be careful not to give much moisture till the seeds germinate, as an excess of moisture will cause them to rot.

After the plants have appeared above the soil, the temperature should never be below seventy-five to eighty degrees, and the pots must be kept near the glass. In transferring the plants to their permanent quarters do not let them get chilled, and water with tepid water. Cucumbers resent root disturbance, and therefore the greatest care should be exercised.

A week after planting in permanent quarters the laterals should be pinched at the second leaf and then pinched again when they have grown five inches.

No fruit should be allowed to form on a main stem. The plants must not be allowed to bear too freely, as this weakens them. To crop in moderation, especially in the early stages, and cut as soon as ready is a golden rule in cucumber culture.

The plants need constant surface dressing of fibrous loam and frequent applications of liquid manure. The plants must be frequently syringed, and the walls must always be kept damp. Some gardeners advocate the use of strong liquid manure for this purpose. As a rule, cucumbers throw out numerous male blossoms at first, and many of these should be nipped off to encourage the shyer female flowers. If liquid manure is unobtainable, give once a week a reliable fertilizer, but soak the plants with rain water previously. Properly managed, cucumbers will bear for several months.

Cut the fruit as soon as it is a fair size. The plants will cease to yield if the fruits are allowed to grow large enough for the seeds to harden.

As the stems finish fruiting, cut them away; this will give those still in bearing more light and air, but follow each stem carefully to its source, for they are often so entwined that it is easy to cut the wrong one.

Cucumbers in Unheated Glasshouses. For cucumbers an unheated greenhouse must be in a sunny position and protected from cold winds. It is useless to attempt to grow cucumbers in a glasshouse facing north or north-east.

Choose plants of a short, sturdy growth, with dark green leaves. Pale, elongated specimens have been forced too rapidly, and will most likely develop disease.

They may be planted in pots or boxes, or where there is a slate shelf, little hillocks of manure and soil with some crocks underneath for drainage will do well. If pots or boxes are used, they must be filled to within about nine inches from the top with fresh long-straw manure; it may be mixed with rich rotted leaves if manure is scarce, and the surface soil should be a good loam.

Remove the plants if bought in small pots very carefully as they dislike root disturbance. Don't crack the pots on the side, as so many people do, for this often injures the stem or leaves. Push the plant out through the drainage hole. Make a hole in the prepared soil that will only just take the plant—not deeper—otherwise the roots will come in contact with the rank manure too soon. Plant firmly.

Shade with paper in the heat of the day until the plants are well established and then let them have as much sun as possible. Where cucumbers are growing the atmosphere must be kept very moist and the plants, windows, and sides of the house should be syringed at least twice or even three times a day in hot weather.

Cucumbers need very little ventilation, but air must be given at the hottest time of the day.

The temperature must be the guide in the management of cucumbers. If a chilly day, water very sparingly and keep the house closed. The roots must never be allowed to become dry, but neither must they be swamped with water. Experience puts one right on these points. Water with soft water, and if there is no rain water allow a bath of service water to stand in the greenhouse for some hours before using it—the longer the better.

Cucumbers should be allowed to climb to the top of the glasshouse and partly along the roof if they are vigorous enough, and tarred string or wire can be used for their support. Give a little artificial food once a week in the form of some reliable fertilizer, one teaspoonful in one quart of water, first soaking the plants with clean water.

Cucumbers in Cold Frames. It is quite possible, in small gardens, to plant out cucumbers in cold frames. The soil should be well forked over and be quite free of weeds. Partly rotted manure should be placed well below the soil.

Plant firmly (early in June preferably), and keep the frame closed and the plants slightly shaded until they are quite established.

Syringe the inside of the frame frequently to create moisture. Cucumbers in frames must be kept moist or they will be infested with red spider. If the plants show signs of distress in hot weather shade again When frost appears nip off the points of all shoots two joints beyond the fruit. If you fail to do this the frame will be so full of useless greenery that the fruit will suffer.

As fruit develops give water and weak liquid manure (see liquid manures, page 134) alternately without stint. Once the plants are well established the frames may be opened on very hot days, but closed before four every afternoon. With this simple treatment healthy plants should do well.

Ridge Cucumbers. Grow them in little hillocks two or three yards apart, or on a ridge made by digging out the soil to a depth of two feet, and throwing it up to one side. The trench should be filled first with some well-decayed manure, the soil replaced, and the ridge left a day or two to settle down.

Before putting in the plants firm the earth down with the back of the spade to prevent it crumbling as you work. Plant slightly on the slope running towards the trench; this gives protection and the roots will reach the manure in due course.

In a hot summer the crop will be good; if cold and wet prevails, it will be an utter failure. In an unheated greenhouse ridge cucumbers do well, and the flavour is better. It is a good plan to cover the ground where ridge cucumbers are growing with grass cuttings. The grass keeps the earth nice and moist and the fruit clean.

In good weather these outdoor cucumbers grow very quickly, and they should be cut when a fair size to induce the plants to go on producing. Like the hothouse variety they will not overwork themselves once one of the fruits has hardened seed.

Keeping Cucumbers for a few Days. If a number of cucumbers are ripe all at once and are for home use do not allow them to remain on the plant, but cut the ripest, keeping the tips in water in the greenhouse *where they were grown,* but not in the house.

Mildew. This fungus is distinguishable by a white network on the leaves of ridge cucumbers. It is usually owing to lack of moisture. Give the plants a good soaking and then mulch them. Dust the leaves with flowers of sulphur when they are damp.

Eel-worm. This small white worm is a most destructive pest and its ravages are distinguishable by the little knobs on the roots. The plant so affected flags badly when the sun is at its hottest, and the fruits do not swell properly.

No remedy is known. Burn affected plants and remove the soil which should never again be used for cucumbers. If soil for cucumbers is thoroughly exposed to the air eel-worms are seldom prevalent.

Cucumber Rot. This disease attacks cucumbers grown in frames in a wet summer. Pick off all affected parts most carefully (if carelessly done the spores will be scattered all over the plant), burn them, and dust with flowers of sulphur.

Red Spider. The presence of red spider indicates poor culture particularly and lack of moisture. Wet the hot-water pipes and dust them with flowers of sulphur at night just before closing time.

DANDELIONS

DANDELION. *Leontodon Taraxacum.* Perennial.

Forced dandelions are a valuable addition to winter salads, and a very different thing from the leathery, dark green leaves grown in the full light of day. They are an excellent substitute for endive.

Lift a few roots of strong well-grown dandelions—they root very deeply, so lift with care—and after twisting off the foliage plant the roots in a flower-pot or box, placing it in some convenient spot, and exclude all light with another pot or box. Water occasionally, and when the leaves are well grown gather as needed and cover up the plants again.

Failing a corner in a greenhouse, they do well in the cellar or even in the kitchen (if the cook regards them with a favourable eye!). In the spring the leaves may be blanched in the open by placing pots over the plants.

ENDIVE

ENDIVE. *Cichorium endivia.* Very common in most parts of Asia, and introduced into this country early in the sixteenth century. Endive was cultivated in ancient Egypt, and it was a common ingredient in salads in classical days. It has been cultivated in this country for 300 years, but only began to be popular in the nineteenth century.

Endive will succeed in almost any soil provided it is rich. Heavy soils, however, should be lightened for it. Owing to its tendency to bolt endive is usually thinned, instead of being planted, out.

Sow in drills eighteen inches apart and cover the seed lightly. After sowing make the surface of the bed very firm by beating with the back of the spade, and unless the ground is moist the bed must be watered before sowing. For autumn supplies sow in June and July, and for winter and spring in August and September. The later varieties need good drainage and succeed admirably on a sloping bank.

Endive which has been planted out must be kept well watered in a dry spell or it is liable to bolt. Give endive plenty of room, for the plants are naturally of a spreading habit, and do not deprive them of their outer leaves. This is often done with a view to economizing space, but better a dozen well-grown specimens than rows of half naked ones.

Do not blanch until actually necessary, as blanching stops growth. It takes ten days in summer and three or four weeks in winter to blanch endive properly. In summer this is easily managed by tying up the leaves loosely, allowing room for the young leaves to expand; or a flower-pot with the drainage hole covered may be inverted over each plant. In winter and spring the most satisfactory way is to lift a few plants every week with a good ball of earth and place them in a dark shed or cellar. Or they may be planted out in cold frames, or under the protection of a wall, and blanched in the ordinary way.

GARLIC

Garlic. *Allium sativum.* Perennial. A native of Sicily, and introduced into this country in the sixteenth century.

Plant the bulbs at the end of February, and only just cover them with soil. Allow nine inches between the bulbs and fifteen inches between the rows. Garlic likes well-dug and finely-raked soil.

Do not leave the bulbs on the ground to dry when the crop has been lifted. Tie them in small bunches and sling over a rail or fence. Take under cover at night. Store in a cool dry place.

GOURDS AND PUMPKINS

Gourds (*cucurbita pepo*) and Pumpkins (*c. maxima*). Tender annuals. Common in tropical countries, and introduced into this country in the sixteenth century.

They can be eaten either green or stored when ripe and cut as required through the winter.

Sow the seed in May singly in three-inch pots in a temperature of about sixty degrees. It is very important to grow them steadily and to avoid giving the seedlings more root disturbance than is absolutely necessary.

Harden off and plant out at the end of May, but not if the weather is unpropitious. To get the best results prepare the site as for marrows. Gourds and pumpkins need plenty of sun and ample moisture.

HORSERADISH

HORSERADISH. *Cochlearia armoracia.* Indigenous plant, but greatly improved by cultivation. It is one of the *cruciferae*, and therefore distantly related to the cabbage tribe.

Horseradish will grow anywhere, but to obtain good roots the ground should be well dug and trenched and good manure placed in the bottom spit. Plant pieces of the root each with a crown six inches deep and one foot apart. Plant in spring.

The roots should not be lifted till the following year. Properly grown horseradish has roots one-and-a-half to two inches in diameter. The roots may be stored in moist sand for several weeks, and as horseradish is needed in the winter it is best to do this, for in a severe frost it is impossible to dig up the roots.

Strictly speaking, a new horseradish bed should be made annually, but there is seldom the time or space for this. Part of the bed, however, should be overhauled annually, the best roots replanted, and the next best stored for use. If left year after year without attention the plants deteriorate rapidly. Horseradish roots must never come in contact with rank manure or the roots will fork and be impossible to scrape.

KOHL-RABI

KOHL-RABI. *Brassica oleracea Caulo-rapa.* Biennial.

Modern science has not yet decided what this vegetable is, though it has been suggested that it is a hybrid between a cabbage and a turnip. No wild type of it exists. It has a turnip-like body, but whereas the turnip is a swollen root, the kohl-rabi is a swollen stem.

The value of kohl-rabi for dairy farming is well known. Cows are very partial to it, and it increases the milk supply.

Kohl-rabi is not appreciated in this country, chiefly because it is usually eaten when too large. This vegetable should be eaten when it is the size of a rather small orange, for after that it becomes strong and woody. Sow the seed in April in shallow drills and transplant, allowing eighteen inches to two feet apart each way. Sow earliest green for summer and early purple for winter use.

LEEKS

LEEKS. *Allium porrum.* Biennial. The leek is one of the oldest cultivated vegetables—it has been cultivated for at least four thousand years. Linnaeus gave the leek the name of *allium porrum,* and it is now generally agreed that the plant is a cultivated variety of *allium ampeloprasum,* a species which is common in both Europe and Asia. The leek has been grown in this country from Saxon days, and possibly earlier. The popularity of the leek in Scotland and the north of England is probably due to its extraordinary hardiness.

Quick uninterrupted growth is the secret of good leek culture. Leeks like a light rich soil, though there never was such a vegetable for making the best of what you can give it. Left-over seed from last season may be used, as leek seed retains its germinating powers for three years.

Half an ounce of seed should sow two rows, each thirty feet long. Make V-shaped drills one inch deep and fifteen inches apart, and take no more seed than you can hold between the finger and thumb and drop them along. All vegetables should be sown thinly, but especially leeks and onions, as these two crops dislike root disturbance more than any others, and if the seed is sown thickly the masses of fine rootlets get entangled, and in thinning out injury must be done to the remaining crop. Also in thinning, the smell of leeks and onions is so pungent that it attracts certain insects that are harmful to the crops.

The seed should be lightly covered in with the removed soil, and the earth firmed down with the back of the spade. Like onions, leeks thoroughly appreciate this attention.

To grow extra large leeks sow in January in a temperature of sixty degrees. Sow in six- or eight-inch pots. The compost should be rich and very firm —one part well-rotted sifted manure to two parts good loam with a sprinkling of sharp sand on the surface soil.

Cover the seed very lightly and transplant, as soon as large enough to handle, into shallow boxes filled with good soil. The seedlings should be three inches apart, and give them attention in the way of air on fine bright days, and a little tepid rain water when the surface soil shows the need of it.

Leeks look much tidier if, when planting out, one arranges them so that all the leaves point *along* the rows instead of across them, or some pointing one way and some another.

Seedling leeks sown in March should be transplanted at the first favourable opportunity during the first week in August.

Ground preparation is much the same as for celery: a trench should be dug about two feet deep and, unless the leeks are required for exhibition purposes, the trench may be V-shaped at the bottom. If the object is to get very fine specimens it must be wide to contain more manure.

First put in a layer of fresh manure about five or six inches deep; then the same quantity of well-rotted manure, and finally fill up with any good mixture of leaf mould and soil of a loamy nature, or rotted manure and good soil.

At the time of planting, the leaves should be shortened a very little (it is interesting to remember that this was the custom also of our Saxon ancestors), and distances between the plants must vary according to the nature of the soil and requirements of the cultivation. If the soil is strong, twelve inches should do, but on poorer soil useful crops may be grown with the plants six to eight inches apart. If using a dibber take care in planting that the roots rest on the ground and do not remain half way down the hole.

Great care must be taken that no soil gets between the leaves. If it does, it is almost impossible to free the leaves from grit before cooking.

Leeks grow so close and compact that they cannot be pulled apart as celery can be, and gritty leeks are leeks spoilt. When planting, they should be put in as deep as the base of the leaves and closed in round the plant *without pressure.*

Give plenty of water at the time of planting and at least twice a week afterwards in dry weather. As the plants mature, liquid manure may be given.

Stir the ground between the plants from time to time with a small hand-fork, and either the surrounding soil must be drawn up, or some fresh soil added to form an earthing-up.

As the leaves grow, they should again be cut, this time about half way down the plant, as one sees on bought bunches. If this is not done, the plants will run to leaf and be useless.

By July leeks need a little extra nourishment. Spent soot and water (see page 141) or a light dusting of soot once a week will work wonders. Take care not to earth-up leeks too much at first, as this often rots them.

Leeks allowed to remain in the ground after early spring form small white bulbs round their roots which can be used in cooking, instead of onions, but to obtain these all flower-stems should be nipped out as they appear.

Leeks should be left in the ground till wanted, as they withstand the severest weather. If ground is wanted that contains leeks they may be carefully lifted and stored in dry sand in a very dry place. They will keep for six weeks in good condition, but it is not advisable to store them longer.

LETTUCES

LETTUCE. *Lactuca sativa.* Hardy annual. A native of North Africa and the eastern parts of Asia, and introduced into this country in the sixteenth century.

Lettuce seed keeps its germinating powers over several years. The first sowing should be made in February under glass. Use a shallow box and give ample drainage with pieces of small clean crocks.

Any sweet light soil will do. Scatter the seed thinly and cover lightly with soil. Tom Thumb is one of the best for early planting.

Lettuce seed may be sown in a compost of one part rotted leaf mould, one part good loamy soil, and one part silver sand. In all box seed sowing keep the sand well to the surface.

When planting out in the open put them nine to twelve inches apart in a bed with the soil in a fine condition, and shield with a piece of wood supported on a flower-pot at each end. Placing a full-grown lettuce near seedling lettuces is a good way of protecting the latter from slugs.

Lettuces are very thirsty plants, and they should be saturated with water at the roots in drought. If watered from overhead rot often sets in and they are spoilt.

Liquid manure (see page 134) is beneficial to them once a week when they are in full growth.

Lettuces like *deep* soil enriched with manure. Lettuces forming heads should be given weak liquid manure once a week or one teaspoonful of nitrate of soda well mixed in one gallon of water, or half an ounce of sulphate of ammonia in two gallons of water. If not self-hearting arrange the tie just far enough down the plant to prevent rain getting into the oncoming heart and rotting it.

Lettuces to be sown for eating in November onwards should be sown very thinly half an inch deep in a sheltered position.

A magnificent lettuce for standing the winter well is the black-seeded Bath cos—a rich bronze brown. Two of the best cabbage varieties to stand the winter are Stanstead Park and All the Year Round.

It is best to make two sowings, one at the beginning and one at the end of August.

If the autumn is exceptionally warm, the seedlings will come along so fast that they will be ready for eating by November. Do not transplant lettuces to stand the winter, but thin them out well. It is an exploded idea that those left thickly sown protect each other; it merely makes them weak and sickly, whereas, properly thinned, they become robust plants.

It is a good plan to protect them during very severe weather with boughs of holly which will keep out many degrees of frost, and yet not lie wet and heavy on them. Or a winter supply may be sown in a frame.

Before planting seedling lettuces in a cold frame sprinkle the earth with a good insecticide, as few things are more beloved by insects than lettuce seedlings (if you can put a toad in the frame for a bit, do so: they beat all the insecticides put together for keeping down pests of all sorts).

After the soil has been well forked over and cleansed, raise the surface of the bed uniformly to bring it nearer the glass for the plants to get all the sun they can during the winter.

Plant six inches apart, but give more room to cabbage varieties.

Shade till they have established themselves and give watering when needed, but no liquid manure till the spring.

Early spring lettuces are precious, and it is quite unnecessary to pull a whole lettuce at a time if only a portion is needed. Take only what is wanted, but pull the leaves away right from the stem, and from the wound fresh growth will spring out. If cutting them, leave the stump and a few leaves and new tender growth will soon appear.

Where there are many trees or where the ground is not thoroughly well drained it is useless to attempt winter lettuces.

Lettuces in Pots in a Cool Greenhouse. The seedlings should be planted in seven-inch pots, allowing three cos or two cabbage lettuces to each pot. It is a better plan to raise lettuces separately in smaller pots.

Everything must be scrupulously clean in the way of drainage crocks, and the compost good. Before putting in the crocks, place a tiny piece of old sponge or flannel smothered in soot over the drainage hole, for where there is a lettuce an insect will get to it if it possibly can. Half fill the pot with compost, spread out the seedlings rootlets, fill up with soil, and press firmly in. Give a watering and place in the shade until the leaves cease to flag; then place on a sunny window-sill.

When the hearts begin to form, give liquid manure in the form of a teaspoonful of any good fertilizer diluted in a quart of water, but water the plants with clear water first. Lettuces can be grown to perfection in this way in a sunny little greenhouse and are well worth the trouble to secure early ones.

Mildew. Distinguishable by a white growth under the leaves. If left, it destroys the plant. This disease as a rule only attacks early lettuces in frames, etc., and is frequently due to lack of ventilation and too much moisture. Burn all affected plants, and dust with flowers of sulphur.

MAIZE

MAIZE. *Zea Mays.* Annual. Native of America, and introduced into this country in the sixteenth century.

Sow the seed from the end of February to the beginning of April in light rich soil, in well-drained pots or boxes, in a temperature of 55 to 65 degrees. Plant half an inch deep and about an inch apart.

When the seedlings are two inches high, they may be transplanted into two-inch pots, and in May placed in a cold frame to harden off. Plant out at the end of May if there is no fear of frost.

People who keep fowls should certainly grow maize, as chickens like the leaves and stems.

In planting out seedlings do not place them in one long row, because they are wind-fertilized, and when the plants are in a single row the wind cannot so easily carry along from plant to plant, the pollen (of which the long silky fringes on the young cobs are full), as when there are several short rows.

The leaves make good food for pigs and cows, and the long stems can be dried and used as firewood.

Howling Mob is a very good variety, and the best to grow in this country, as it matures early. Maize often fails to ripen because the wrong sort is chosen. It is essential to get an early and dwarf variety.

Maize is a greedy feeder, and should be sown in well-manured ground in drills about a yard apart; the seed being two inches apart. Unless the ground is very rich give liquid manure once a week.

MINT

MINT. *Mentha viridis.* Perennial.

Mint will succeed in almost any soil, but what it likes is a damp soil. A mint bed requires very little attention, but it should have a plot to itself or else be kept well within bounds. It makes runners with incredible perseverance.

Make a bed from divisions of old roots or cuttings (the latter are best), and place either roots or cuttings one foot apart each way. Do not put more than an inch of soil over root divisions. In the autumn dress the bed with well-rotted manure and leaf soil.

To obtain an early supply, cut down some of the healthiest looking stems towards the end of September. This will give the roots a rest and strengthen them, and in October they can be lifted and placed in either big pots or boxes.

The end of May or early autumn are good times to make a fresh bed of mint. Prepare a nice sized piece of ground by deep digging and give it a dressing of bonfire refuse. Select the best pieces of mint with roots attached, and plant out. Almost any little bits of mint roots will grow, but do not put more than an inch of soil over them.

A new mint bed made from cuttings (taken preferably towards the end of June) is more satisfactory than divided roots, because cuttings are young and healthy.

Mint Rust. Easily distinguishable by the yellow patches on the stems, etc. It is waste of time to attempt a cure with fungicide.

Lift all the roots, handling them carefully to avoid scattering the spores, and burn them. Dress the ground with lime and make the new mint bed elsewhere.

The mint bed should be re-made at least every three years to keep the stock healthy

MUSHROOMS

MUSHROOMS. *Agaricus campestris.* Hardy perennial. Indigenous plant.

Elaborate mushroom houses with hot pipes, etc., are quite unnecessary for successful mushroom culture. If grown indoors an even temperature is important. Mushrooms can be grown either in the open, or in a cellar or shed, or under the staging of a greenhouse.

Any kind of manure will not do. It must be horse manure, and procured from a stable where the horses are fed on hay or corn.

Get fresh manure, fork it well over, and take out any long litter and put on one side for the top of the heap. Store the manure under cover and leave it to ferment, which will take from eight to twelve days. To test the heat, drive a stick into the centre of the bed, and if it is so hot when withdrawn that it is scarcely possible to hold the stick, leave the bed a few days longer, giving a second turn over with the fork, and leaving it heaped as before. If there is only a gentle heat, the bed may be made at once.

To make the bed:

A bed in the open should be made on a piece of hard dry ground; it should be about three feet at the base and built up into a ridge. A mushroom bed should be very firm. A loose bed will produce those miserable, thin-stemmed, leathery, forced specimens one so often sees for sale, and which are so different from those gathered from pasture land.

To obtain the required firmness one part good loam should be added to four parts manure, and as the bed is worked up it should be continually beaten together with the back of the spade. After three or four days insert a thermometer, and if it registers 75 to 80 degrees (not less than 75) the bed may be spawned.

Buy spawn from a good firm, and break each brick into pieces about the size of an egg. Bury them in the bed, four inches deep, and about seven inches apart. To finish the job neatly a thin covering of fine soil should be evenly placed over the whole, and some covering must be to hand in the event of bad weather. Matting, bracken, or straw will do.

The manure shortage during the War taught mushroom growers that a mixture of manure and good loamy soil (about a sixth of the latter) not only answers just as well as all manure, but the mushrooms are larger and firmer.

Some experts ascribe the failures of many amateurs in mushroom growing to the fact that they start beds in the open too late. Mushrooms can be raised in the open almost all the year round if one adopts the right methods, but the ordinary simple work of making an outdoor bed is usually started in July. The first week in June is usually chosen by experts.

Beds in the open may be as long as one likes, but they should not be wider at the base than three feet, because a long narrow bed keeps down the fermentation better than a short one. Bank up the manure procured in a corner and turn it several times to take out the heat, always leaving it in a long heap.

Insert the spawn for outdoor mushrooms eight inches apart, and put a layer of fine soil over them. Over the soil place mats or clean straw, and with ordinary luck the crop should be ready in six or seven weeks, and continue to yield for about the same time.

Keep a look-out for slugs and wood lice, which do considerable damage to the mushroom crop.

Gather mushrooms by twisting them at the base of the stems, but do not cut away the superfluous stalks until they are to be cooked.

Instead of using salt and tepid water to moisten the beds when they become overdry, try a small handful of nitrate of soda to two gallons of tepid water: the results are very good after such treatment.

The following method of growing in limited space is worth trying in a moderately warm cellar:

Fill boxes about two feet square with oak and beech leaves to within three inches of the top. Sprinkle water between the layers and ram very firmly. Sift three inches of good rich soil on the top. Make very firm. Insert the spawn in pieces about the size of a bantam's egg so that they just rest on the leaves. Water with tepid rain water, and cover with sacking. Inspect occasionally, and if too dry, sprinkle with a little tepid water. There should be a good crop in six weeks. A fair second crop may be obtained by watering rather liberally with one ounce of sulphate of ammonia to one gallon of water.

Mushroom Grub. This little insect eats the inner part of the fungi, but they seldom attack mushrooms grown in the open. Sprinkle the beds with a solution of salt and water (one ounce of salt to one gallon of tepid water). In bad cases disinfect the mushroom house where the beds have been removed with sulphur fumes, as this kills all plant and animal life.

Mushroom Disease. Frequently introduced in the spawn. Hence the importance of buying spawn from a first-rate firm. The disease is distinguishable by the swollen stems and the small misshaped mushrooms. In bad cases the crop must be cleared and the house disinfected with sulphur fumes. In mild cases remove carefully and burn all the diseased mushrooms.

MUSTARD AND CRESS

MUSTARD (*sinapis alba*) AND CRESS (*lepidium sativum*). These are the only vegetable seeds which should be sown thickly.

When growing mustard and cress it is a good plan to cover the boxes with lengths of old muslin coarse enough to let the seedlings come through it. The seed husks which always cling to the stems of cress and are tiresome to wash away are then held back on the underside of the muslin.

Sow cress four or five days earlier than mustard, as it takes longer both to germinate and to grow.

Few people seem to grow mustard and cress in the winter, but it is quite easy. Fill any shallow boxes with old potting soil and very sandy soil, and firm it down very tightly as the seed should not be covered. If the soil is loose, the seed will lift itself up and not make firm root hold. Soak the soil with very mild liquid manure. When it has drained away scatter the seed thickly and cover it with brown paper, putting the box in a warm place until germination takes place, when the paper must be removed. If the box is kept on damp ashes, or two or three bricks, occasionally damped, no other moisture is needed. This is a much better way of keeping the soil damp than by overhead watering, which beats down the cress.

ONIONS

ONIONS. *Allium cepa.* Biennial bulb. Their native habitat is central Asia, and they have been grown in this country from the earliest times.

Give onions the most open and sunny position you can, and spare no trouble in preparing the bed.

The ground should be trenched at least three feet deep, and the bottom spit liberally enriched with manure. The bed to receive onion seed should always be prepared some time beforehand. Onions will stand any amount of richness, but it must never be rank. Hence the great importance of allowing time for any manure to become well incorporated with the soil.

Onions can be grown year after year in the same bed. It should be worked up again and again, adding sifted wood-ash, salt, and soot. The idea is to get the soil so fine that it would pass through a colander. Trenches that have held celery can be easily worked into an ideal bed for onions, which revel in a rich soil and deep root run.

Few amateurs realize what huge onions can be grown if they have a chance of rooting deeply.

In preparing heavy ground for onions allow a barrow-load of horse manure to every square yard, and this should be well mixed with the soil to a foot below the surface. For lighter soils cow or pig manure would do better.

Light soil may be steadied with heavy loam, or even with clay well broken up, but one must always bear in mind that the onion bed must be of ground porous enough for the rootlets to make headway from the start; they cannot battle successfully through clogged soil—but the surface condition must be made firm by rolling or treading. This is because the plant, being bulbous and growing partly out of the ground—sitting on the soil, so to speak—would not develop in unsteady surface soil; it would wobble about with every high wind. The object then is to have a fairly loose soil below ground and a very firm one on the surface.

When planting out onions raised in boxes, or transplanting thinnings, any manure used in the bed should be quite eighteen inches below the surface soil. Remember that, though so pungent themselves, onions dislike anything strong smelling, such as privet, near them.

In raising onions under glass in January and February sow the seed singly in holes made with a match about a quarter of an inch deep, and two inches apart in the rows. If sowing outdoors make very shallow drills for onions for storing and cover the seed very lightly. Drills for bulbs to be used as wanted should be one-and-a-half inches deep. Have the drills at least one foot apart.

To obtain the best results sow each seed separately an inch apart. This sounds troublesome, but there is no comparison between onions so raised and those which have had to endure the root disturbance entailed by thinning.

Old-fashioned country gardeners say that it is a good plan to leave onion seed out all night exposed to heavy dew before sowing. If this is done, nearly all the seed germinates, and there is reason in it, for the moisture would have much the same effect as a mild soaking, which of course many gardeners believe in for peas, beans, parsley, and other seeds of a hard nature.

Onions should be thinned as soon as they appear above ground, as their future welfare depends on early thinning. They dislike root disturbance more than most vegetables. Consequently, sow thinly, and thin with the utmost care. The work should be done after rain. The thinnings will transplant, but they must be very firmly planted, and not deeply.

Give Ailsa Crag, Giant Rocca, and Tripoli varieties plenty of room. Distance apart in thinning must depend on the sort grown. It varies from four to twelve inches. If growing medium-sized bulbs, such as King's Improved, Ailsa Crag, or Exhibition Globe, leave ten inches between at the final thinning.

Onions are most easily grown from seed sown straight into the ground.

In planting out onions, the long white roots die very quickly when exposed to the air, and therefore they should be kept with their roots in water or covered in a damp cloth till actually put into the ground. Give the roots ample room, but plant so that the bulb is half out of the soil. If the tips of some plants have broken, remove all damaged parts or they will lop over, rest on the ground, and be dragged underground by worms, when decay will set in and perhaps affect the rest of the plant.

Onions planted out from boxes often throw out flowering stems very early in the season. They should be nipped out as soon as possible, and if they have grown to any size, the flowering head should be nipped out half way down the stem, not just under the head, leaving a long bare stem to be fed at the expense of the bulb. Neither should a neglected flowering stem be nipped out quite at the base, as this would probably injure the plant.

Work at the onion bed—for weeding, etc.—from each side of the bed if possible. Do not tread on the bed if it can be helped. The leaves of onions are hollow and very brittle and easily injured.

Never water onions unless in a time of quite exceptional drought. Onions show by the way they raise themselves out of the ground and sit on the soil that they need the drying effect of sun and air. To water them is to undo the good they are doing for themselves. Onions have to be bone dry to keep well through the winter, and if the bulbs and stems are full of moisture from artificial watering and then a wet spell sets in, it is almost impossible for them to be dried off properly.

Onions are slow growing and require helping along. A dusting of soot is good now and again. A sprinkling of nitrate of soda is also very useful, the first application being given at the thinning-out stage, and two or three more at intervals of a month. Crush the nitrate of soda and apply after rain.

Onions should not be given liquid manure when growing in good soil. What they like is a rich sweet soil and occasional dressings of salt and spent soot (*i.e.*, at least ten days old). At the grounds of one of the leading seed merchants salt and soot are preferred to the richest manure for onion crops.

Onions should not, of course, be allowed to run to seed. Should this happen, however, the flowers or seed heads should be nipped off about half way down the stems on each plant. If this method is carried out you will still have fair-sized onions, but the bulbs may be double or more instead of one fine bulb.

In bending onions, to prevent the sap rising and so induce ripening of the bulbs, be careful not to break the stems. If this is done just above the bulbs, young shoots will often spring from the cracks, thus making the onions flabby instead of sound and firm. Good winter onions mean bone dry onions, and they should be stored in a very dry airy place.

A common cause of onions not keeping well through the winter is that people will continue to feed them with liquid manure and artificials long after they ought. *No manure of any sort should be given after the tips of the leaves begin to turn yellow.*

When the leaves begin to turn, stop feeding and bend over the leaves just above the bulb; growth will be checked as far as the stem is concerned, but the bulbs will enlarge.

If onions are lifted rather late when the ground is damp, do not leave them on the ground to dry in the sun, but tie them in bunches and sling them over a rail or fence to let the air play all round them, or hang them on a clothes line, either in bunches or in net bags.

Onions to stand the winter. In sowing onions to stand the winter be careful that the rows are far enough apart to admit of thorough hoeing. When the rows are very close together it is almost impossible to hoe without root disturbance.

The ground for an autumn sowing of onions should be well dug in August, and a good dressing from the smother fire be given it, or wood-ashes mixed with soot. Choose a high and dry position, for onions cannot endure stagnant moisture.

Giant Rocca, Tripoli, and Globe are still about the best onions for autumn sowing. Seed sown in August will give plants that are almost certain to be free from onion fly, and that will be much more likely to make good bulbs than the plants forced along in boxes early in the spring. Raising your own vegetables from seed is, with few exceptions, the best method. The chances are in favour of better results because they mature in the same soil and under the same conditions of climate in which they were born, so to speak. Many of the onion plants and other vegetable seedlings which one buys in the market are not raised in England, but in France and Holland, so it is no wonder that many give no return for the trouble and money spent on them. It is these imported onions which, when planted out in English gardens in spring, are more frequently than not a failure.

Protecting autumn-sown Onions. Before very bitter weather sets in it is a splendid plan to stick autumn-sown onions as you would a row of dwarf peas, placing old broad bean haulms on the bleak side of the sticks.

Drying Onions. An excellent way of drying onions is to place them on a piece of wire netting stretched on supports a foot or so from the ground. The air can then play all round them, which is the secret of good drying. They are dry when the skins are a nice nut brown and the necks shrivel.

Grade them before storing, placing the firmest and best to keep longest, and hanging them in bunches in a cool dry place.

Onions should never be left for any length of time without being overhauled, as one or two rotten ones will affect the others.

It is most important that onions should be stored in a cool dry place. Amateurs often confuse *dry* with *warm*. Warmth induces vegetables to sprout, especially in damp weather. *Cool* and *dry* are the conditions for storing all vegetables and most fruits.

Pickling Onions. Silver skin is the best for pickling. Sow in shallow drills ten inches apart and lightly cover, and then firm the soil by rolling or treading. Pickling onions should not be thinned as one does not want them to grow large, but the onion fly should be kept in check by dusting the seedlings with soot and lime. Ground previously occupied by onions is ideal for winter cabbages.

Tree Onions, or Everlasting Onions. Tree onions are widely cultivated in the north, and the shallot-like bulbs that grow on the stem of the plant come in handy and save the ordinary onions to be stored for winter.

Potato Onions. They should be planted in March about the same time as shallots. Allow one foot apart each way. They like a rich soil, and if it is poor, a little good fertilizer or well-rotted manure may be forked round the bulbs with a small hand fork during their growth, but take care not to disturb the roots. Unlike potatoes, the bulbs should rise to the surface, and consequently they must not be earthed-up. As the plant puts forth leaves, the bulbs cluster round them and sit on the ground, so to speak.

Severe winters are fatal to the potato onion, and it should only be cultivated in the south unless it can be well protected from frost.

The Onion Fly is very distinctive—dark grey with red eyes. The maggot of this fly lays its eggs on the skins of the young plants. The eggs hatch early in the summer, and the grubs eat their way into the bulb. If the bulbs turn yellow while young, the onion maggot is at work, and a good dressing of common salt and soot mixed should be hoed into the plot at once. This will check the damage to a great extent, if not quite kill the pest.

To prevent attack by onion fly and similar pests get a ball of thin string and immerse it in creosote. Then run it along the rows, just fastening it at the ends to the name pegs and staking it in the middle with a hairpin. This is very effective.

Onion Smut is now a notifiable disease. It is easily seen. The leaves and outer scales of the plants have black streaks running down them, looking as if a sooty thread had been drawn along them.

Prevention is better than cure, and it is often hopeless to try and save the plant. Soot and salt are the best, cheapest, and safest things to use. All who grow onions for market use both liberally, as they are not only a preventative against disease, but splendid fertilizers. Sprinkle between the rows after rain, taking care that the soot if fresh does not touch the grass of the young plants.

Onion Mildew. A very common disease, distinguishable by yellow patches changing to a dirty mauve and the gradual decay of the leaves. The growth of the bulb is arrested, but the neck lengthens rapidly. Keep a sharp look-out for this disease in its early stages, and remove all affected plants carefully and burn them. Dust with flowers of sulphur every fortnight.

PARSLEY

PARSLEY. *Carum petroselinum.* This is probably the most commonly grown and most widely used herb to-day, but until Edward VI's reign it was seldom grown in England. People whose gardens are infested with rabbits would be well advised to avoid growing this herb, for rabbits and hares will come any distance to secure it.

It is an old country saying that parsley seed goes seven times to the Devil and back, and that is why it is so slow in germinating. Superstitious gardeners will never transplant parsley.

Parsley seed retains its germinating powers three years, but it is advisable to use fresh seed. Even in plots too small for anything but flowers parsley looks decorative if the right kind is chosen. Crested Bouquet is like a lovely compact fern.

One frequently sees the advice to sow parsley in a damp part of the garden. Ground always damp usually means sour ground, and this will not only cause parsley roots to rust, but the crowns will be affected and the leaves poor. Self-sown parsley is always much finer than hand-sown, and where the garden is large a self-sown root of parsley is never unsightly.

To tie a ripe seed head on to a string and attach it to a tree where it can swing about in the wind is an old-fashioned method of obtaining self-sown parsley.

Parsley thickly sown gives very poor results. Give the plants a foot each way, and they will be a joy to look at. From six plants, given a right amount of space, you will get more and finer parsley than from fifty crowded and undersized plants.

The ground for parsley should be thoroughly well dug, and if the soil errs on the heavy side, lighten it with wood-ashes and road grit (but don't get the grit from roads which have been tarred). Parsley also appreciates soot.

When you have sown the seed a good half inch deep, give the bed a good banging down with the back of the spade. Sown unsoaked the parsley does not appear for about six weeks. Parsley seed soaked in water germinates in about three weeks. Don't soak parsley seed when planting the winter supply.

Parsley often suffers from rust, and the roots die off. When the plants are looking sickly they can often be brought to a state of health by watering them with soot water. Strong soot water diluted in six parts clear water is about the right strength. Dust the parsley bed with spent soot often during the season; it can do with a good deal of it. Parsley appreciates nitrate of soda—two-and-a-half ounces to the square yard.

In sowing parsley for winter use be sure the seed is sown deeply in well-dug ground. This point is far more important than that the soil should be heavily manured. It is sometimes very hot in September and early October and a bed of parsley sown for winter use will wilt and turn yellow unless the soil is thoroughly dug for the rootlets to penetrate for moisture.

A winter parsley bed should be made square, and then it is easy to give it protection during the severe winter months.

Parsley in Boxes. Parsley likes a deep soil with plenty of root run, so when sown in boxes they should be deep rather than wide. Sow half an inch deep. Thin out well when the plants are up, and keep the surface soil well stirred.

PARSNIPS

PARSNIPS. *Peucedanum sativum.* Hardy biennial. Indigenous plant.

The full germinating power of parsnip seed only lasts a year. Seed must be therefore from a reliable source.

Parsnips, like all root crops, detest rank manure, but not sweet well-rotted stuff, though they like the latter at least a spit down. They need plenty of lime in their soil, and if the soil lacks lime it must be added. Work in the lime some time during December or at the turn of the year, so that there will be time for it to settle before sowing time in February.

Parsnips will do fairly well in rather poor soil, provided it is well and deeply dug. It will naturally give better results in a rich soil, but the ground must be rich with the liberal dressings of a previous season.

Parsnips do best in a rather heavy soil, for light soil often causes rust. They should not be intercropped with other vegetables, for their luxurious growth needs all the light and air in their vicinity.

When the seedlings are two inches high begin thinning out, and do it very gently to avoid root disturbance. Some careful gardeners do the thinnings of parsnips, carrots, etc., with sharp scissors, and it is quite a good idea. The remains of the cut seedlings rot underground and help to manure the remaining crop, and there is no root disturbance whatever.

To grow exceptionally good specimens drive an iron rod—an old stair rod will do—well down into the soil at six-inch intervals, and wriggle it round in an outward direction until a hole is made, large enough to be filled up with a mixture of fine soil and well-rotted and sifted leaf mould. If in February two or three seeds are lightly covered in in each prepared hole, and the strongest seedling only left in place when the seedlings are an inch or so above ground, the trouble of planting in this way will be well repaid, for the roots will go right ahead in soil they like. This is a specially good method on cold heavy soils.

Sow any time in February or early March, always remembering that there must be a certain amount of warmth in the soil to set up the chemical process of germination, and that unless this warmth is present the seeds are much better above ground, as they are very likely to rot in cold unkind soil.

Germination is apt to be very irregular, and three or four seeds should be placed not too closely together, from six to twelve inches apart. If all seeds germinate the superfluous seedlings are easily removed and, with care, will transplant.

Of the varieties Tender and True is best suited for soils on the heavy side, as it does not grow to the length of The Student. Tender and True is, moreover, perfect in form and of fine flavour.

If the soil is well drained and fairly free from insect pests, lift parsnips only as they are wanted. They are quite frost-proof. Only lift the crop if it is in a damp situation, or if the plants show signs of some disease—for instance, canker. If attacked by this trouble, the skins will look rusty. Lift the crop and use as quickly as possible. Don't discard parsnips that have shrivelled in storing. If cooked, they are good for poultry and very fattening.

Parsnip, or Carrot, Fly. This fly lays its eggs on the upper surface of the leaves. The grubs attack the leaves, and this stunts the growth of the plant. Pick off all affected leaves immediately and burn them. Dust the other leaves when wet with lime or soot.

Parsnip Canker. Very little is known about this disease, but it is commoner on light soils than on heavy. According to some authorities it is attributable to the carrot fly (see above), and according to others it is a fungoid disease. Dress the ground after lifting the crop with lime.

PEAS

PEAS. *Pisum sativum.* Hardy annual. A native of western Asia. The date of their introduction into this country is unknown.

Probably no vegetable has received more attention from experts during the last half century, and an immense improvement has, in consequence, been effected, not only in size and productiveness, but also in quality. For those with small gardens, it is far better to stick to the best and well-known varieties than to try new sorts until the latter have proved themselves to be of real value.

Undoubtedly, the most important thing to remember in connection with peas is that nothing you can do for them after they have been sown will equal in importance the preparation of the soil beforehand. Soil deficient in lime must be limed. The ground should be dug three feet deep and liberally incorporated with soot and ash from a bonfire. The bottom spit should have a generous layer of manure.

Failing this, peas do splendidly on the sites of trenches which have been filled with house refuse in the way of vegetable peelings, etc. (see house refuse, page 142). Especially on a sandy soil they appreciate the moisture so afforded, and will withstand almost any drought with impunity.

Sowing too thickly is the commonest mistake. Sow three inches apart and protect well from birds.

If the ground is dug three spits deep, and the roots can work their way down into some rich well-rotted manure, or turves chopped up fine, they will do splendidly.

In uncongenial climates peas may always be raised under glass in three-inch pots. Place a little rotted leaf mould at the bottom of each pot, then nearly fill up with good soil and lay in a few peas, covering them firmly. In a temperature of 60 degrees the plants should show in ten days, and if kept near the glass to prevent "drawing," they should develop into robust specimens to be planted out in early April.

Give peas showing bloom a sprinkling of superphosphate of lime, but be careful that it does not touch the haulm. Prick up the surface soil with a fork along the rows—not too near—apply the stimulant, and wash it down to the roots with water. The benefit of this attention will be seen in a few days.

Manures containing nitrogen should not be applied to peas and beans in growth. Pea and bean roots have numerous nodules on them (the more the better). They are made by friendly germs which, in exchange for house-room on the plant, collect nitrogen from the atmosphere for the use of their work. This is why ground which has been occupied by pulse is in such good condition for cabbages and other greens as they, too, like nitrogen.

Pinch out all the tops of the vines in flower. This is not a wasteful practice, as the extreme tops seldom bear pods that fill out to any size. The nipping out sends the strength of the vines into the lower shoots, and the result is early peas, and plenty of them.

Earth-up well-grown peas a few inches after heavy rain. It keeps the soil moist and saves the copious waterings peas need in drought. After the middle of May it is generally waste of time to sow the more delicate sorts of peas; they collapse in hot dry weather. It should be remembered that wrinkled peas are always more delicate than round.

To keep late peas bearing well pick every pod before the peas have a chance of hardening, and all points of side shoots should be nipped out. After September they will not do much good, and the strength of the plants will go to the pods already formed. This also aids a backward crop considerably.

When there is an exhausted row of peas of a really good sort, it is sometimes worth while to take the shears and cut the plants down about half way to the ground. Make a trench on both sides of the row, and place in a mulch of well-rotted manure or decayed grass cuttings. Cover with soil, and if the weather is dry give a good watering. Everything in this case depends on the weather. Given fine fairly warm weather another crop of peas will be ready in October, but this second cropping is only advisable if the ground is not wanted for more important purposes. Most vegetables will work overtime if you pay them to do it!

If you can spare the room, cut down your peas that have nearly finished bearing about half way, give the rows a good mulch of rotted manure on both sides and a soaking to follow, and the vines will soon throw out more side shoots that will flower and yield. This is a very old country dodge.

It is waste of seed to sow peas after the middle of August. It is better to take extra care of the pea crops coming along, and that will bear into October if well managed.

Where the tips are poor and straggling, nip them out; this will increase the pods on the side shoots. Look over the sticks and see that each row has sufficient support in case of heavy rains. The vines are very delicate, and nothing can save them if they get dashed to the ground.

In case of drought, give drenchings of water at the roots wherever possible, but a light watering is not only useless, but harmful.

Unless peas, beans, marrows, etc., are steadily picked, their bearing period will be considerably shortened.

Late sown peas should have special attention as regards watering, as they so often have to make headway in the hottest part of the summer—either plenty of plain water or, if they need a fillip, a handful of guano to two gallons of water. If rain threatens, trench out a shallow depth of soil on both sides of the rows—it takes very little time—and the dry roots will profit enormously. The later sown the peas the sunnier and airier the position must be, and the greater attention they require as regards watering.

It is useless to attempt late peas in town or northerly gardens. In southern country gardens they may be sown as late as the first week in August, but the peas should be soaked for a few hours to ensure quick germination, and they should be sown not more than two inches deep. Early varieties should be used.

Field Mice. Pea pods are sometimes cleaned out by field mice. A good trap is made by sinking jam jars, three parts filled with water, to a level with the soil. Sink a jar at each end of the rows and smear the rims with bacon fat.

Another very good thing to keep all vermin out of the garden is to spread plenty of elder leaves and small boughs about their runs. Neither vermin nor insects can endure any part of this tree. Seedling elders, however, should be pulled up as soon as noticed, as very few flowers or vegetables will flourish near them if they are allowed to grow to any size.

Black Fly. This attacks the blossoms which, owing to its ravages, fail to form pods. There is no known remedy. This fly hibernates under the bark of the pea sticks, and this is why so many gardeners never risk using sticks for more than one season. After cleaning the crop, dress the ground with gas lime, and do not grow peas or beans on the plot for at least three seasons.

Striped Pea Weevils and Spotted Pea Weevils. These are the commonest weevils which attack the pea crop. They attack the leaves and young shoots when they are in the grub stage and, as beetles, begin their ravages very early in the season. They lay their eggs on the roots of the plants.

Either dust with soot or lime, or spray with paraffin emulsion. Best of all, hand pick them off in the evening. Syringeing with clear water is a good preventive as the beetle dislikes damp.

Pea Moth. Very common and, unfortunately, only detected when its maggots are found in the peas when they are shelled. The moth responsible for these grubs is mouse-coloured and appears, as a rule, towards the end of June. As a preventive dust the flowers with spent soot when the dew is on them. Pea haulms should always be burnt, not buried, in order to avoid this or other pests.

Pea Mildew. Distinguishable by the soft white growth on the leaves, stems, and pods. Mildew is frequently due to lack of sufficient moisture, and peas grown on well-trenched ground seldom suffer from it. In mild cases dust with flowers of sulphur. In bad cases the crop must be lifted and burnt.

Pea Spot. Distinguishable by white spots on the pods. Remove and burn all affected pods. In an advanced stage little black dots will be seen on the white spots. If treated before this stage, the disease can be checked. Spray with a solution of one ounce sulphide of potassium and three ounces of soft soap, thoroughly incorporated in two gallons of water.

POTATOES

POTATO. *Solanum tuberosum.* Half-hardy perennial. A native of South America, and introduced into this country in the sixteenth century. Gerard, the famous herbalist, was one of the first to grow potatoes, and they were one of the " rarities " in his famous garden, the site of which was part of what is now Fetter Lane.

Before the introduction of the " Virginia " potato, the sweet potato (described as the common potato in Gerard's Herbal) was commonly grown in England.

A square rod of average soil should yield about four hundredweights of potatoes, and this is considered ample for one person for a year. From this it is easy to calculate how much ground to plant with potatoes for household use. Roughly speaking, eighteen pounds of earlies, ten pounds of second earlies, and seven or eight pounds of main crop " seed " would be required for each square rod of land.

Scotch and Irish Seed Potatoes. Good seed should be immature, and as the climates of Scotland and Ireland are cooler than ours, the potatoes grown there yield more immature specimens than they do in England. Until 1918 experts considered seed the size of a fine egg plum the best to plant, but since 1918 the Board of Agriculture advises using them a size or two larger.

Potato Seed. When moving into a new neighbourhood it is best to find out locally what potato seed does best there, as soil and position make a tremendous difference. Great Scot seems to do well in most soils, and will often yield twenty times the weight of the seed bought. It is an early main crop variety, though often classed among the earlies. Majestic and Golden Wonder are both good main croppers. King Edwards are bad boilers, but there are few to compare with them for frying. Owners of fried fish shops prefer them to any others, and their opinion on this matter is presumably worth having.

Where space is a consideration it is best to grow main crop only. Earlies do not as a rule crop so heavily as the later sorts, and there is always a certain amount of risk from frost.

In planting from "ware," *i.e.*, ordinary potatoes from the greengrocers, or from those grown and stored from last season, do not make the mistake of selecting small specimens because they come nearest to size of bought seed. The proper small sets are grown and stored in an immature state for seeding purposes, but ordinary small potatoes are badly grown *mature* specimens, which makes all the difference. Sets which have been sprouted yield from one to two tons an acre more than those planted unsprouted.

Cutting Potato Seed for Sprouting. Uncut sets of potatoes should weigh about two ounces. If sets are cut they should be cut in wedge-shaped portions. The tuber should be cut in this way to admit of enough flesh being taken to sustain the roots in their first stage. Cut sets need not be nearly so heavy as those that are uncut.

Potato seed, if large enough, may be cut into several pieces, but whole seeds about the size of a hen's egg give the best results.

Where the seed is cut off it is often done at the wrong time. A potato that has sprouted nicely should not be cut into portions for planting until a day or two before it is wanted. That will give the wounds plenty of time to harden over. If cut longer before they are wanted than this the portions shrivel considerably and the first tiny rootlets are defrauded of their proper food.

If old potatoes must be used for seed, the large ones may be cut in two or more nice sized pieces, each containing at least two eyes. The cutting need not take place until growth is well on the way, as if done at the time they are put to sprout the pieces often wither and shrivel away. In every case where a tuber is cut, the wound must be dressed immediately with slaked lime, powdered charcoal, or powdered plaster of Paris, and planting must be postponed until the outer surface has hardened, or rot will most likely set up when in the ground.

Where seeds show no sign of sprouting within a reasonable time, say a month to six weeks (some sorts take longer than others), they are unlikely to give even fair results.

It is best to grow an early crop from uncut sets, and these should be a shade bigger than sets to be planted later on.

As soon as the sets arrive, spread them out in shallow boxes in single layers, with the " rose " end upwards. This is very easy to distinguish as it has more eyes than the other end.

The sets should be in shallow boxes in a fairly warm place where there is light. A greenhouse shelf or a window in the house will do, but the greatest care must be taken to protect them from frost, especially at night. Strong-looking, greeny-purplish sprouts will appear. Potatoes that have sprouted in a dark cupboard or cellar, and that have thrown out long, white, brittle shoots, should *never* be used.

When the sprouts are showing well, rub out all except the two strongest. Growers of exhibition potatoes leave only one eye to sprout on each set, but this is too drastic for ordinary purposes.

Do not lime ground for potatoes just before planting. Lime given every third year is sufficient for this crop.

Potatoes like to start in a warm dry soil, and if the ground is naturally close and inclined to be wet, any dry residue from a bonfire, wood-ashes, chopped dry turves, or like material cannot be too liberally scattered along the trenches. Potatoes revel in such stuff.

Superphosphate used judiciously is a good fertilizer for potatoes. Sprinkle a very little about six inches below the soil on which each set is planted.

Never plant potatoes with a dibber. It is a common practice on heavy soils, but a bad one. The dibber, when jammed into the ground, compresses the soil into a hard compact mass, and this is exactly what potatoes do not want. They like a loose soil to roam in.

In planting fix the line, and with a spade open a V-shaped trench five or six inches deep. Along the bottom of the trench scatter any wood-ash or fine ash you may have. For earlies the sets should be fifteen inches apart and the rows three feet apart. For main crop eighteen inches apart and at least three feet between the rows. The more room between the rows the better.

It is a good plan to use a knotted line or a stick with the required spaces measured off, with a band of bright-coloured paint to keep the sets the right distances apart. It is also a good plan to cut a tiny slice off the ends of the sets, *i.e.*, the part that rests on the ground. This will help growth.

If there is a brownish looking ring visible in the tuber, burn it. The ring is a sign of disease.

Place the seed in position with the rose or sprouted end to the light, and give each one a gentle press down into the soil, being careful of the shoot. Cover in and rake the whole surface level.

Any ground facing south, or backed by a hedge or fence, makes an ideal spot for an early outdoor crop. The ground should be well dug over about two spits, and the surface soil well forked over and allowed to remain for one or two weeks. A good raking should be given on fine days. This will sweeten and lighten it.

After planting, the soil should be well drawn up on each side of the seeds, for frost would be fatal to them, and the more warm and cosy they are in the soil the more prolific will be the crop.

The process of earthing-up must be continued until they mature. Late February is a good time for planting an early crop.

Many country gardeners make a sowing of radishes on top of the early potatoes if they are in a sheltered place. The radish growth protects the tubers from any late frosts, and they are cleared before the potato haulms are far advanced. They must be cleared when the haulms are a few inches high, or they will take away the light and air from the tubers.

When early potatoes are beginning to show, keep your weather eye very wide open, but although frost is fatal to them, you do not want to suffocate them with soil if the nights are mild.

Earthing-up. Some gardeners believe in doing this very gradually. The more old-fashioned method is to earth-up twice; the second taking place about three weeks after the first. The earthing-up of main crops need not be done till the haulm is a few inches high, as there will not be the same fear of frost which there is with the earlier varieties.

On an experimental plot in America, it was recently shown that potatoes hoed up every four or five days during the early stages of growth yielded a forty per cent. increase in crop over those that were grown in the ordinary way.

In bending back the haulms where greens are planted between, it does not matter if some are snapped here and there as long as they are not entirely dismembered.

In hoeing, make the ridges flat at the top on light soil, for if too pointed, the rain will wash down the soil and expose the tubers.

Potato blooms should be removed as soon as they appear, for potatoes are no exception to the rule that if a plant is allowed to flower and seed, the strength goes to that. Modern varieties of potatoes do not bloom nearly so freely as some of the older sorts.

Spraying. Early spraying is advisable, for the less foliage there is the more easy it is to spray, and for the mixture to reach the underside of the haulms.

There are so many diseases about that nothing should be left to chance with a valuable crop like potatoes.

Early potatoes do not need spraying: it is later on in the season that diseases caused by insects and fungi are rampant. Spraying, it must be remembered, is not syringeing, for a sprayer sends out a fine mist that touches every portion of the plant. This is the only spraying that is any use, and home-made sprayers are frequently useless.

Potato disease usually commences its ravages early in July. There are two sprays most commonly used—Bordeaux Mixture and Burgundy Mixture. The latter is perhaps the better of the two, as the unslaked lime in the former often clogs the nozzle of the spraying machine or syringe.

A Good Spraying Mixture. To ten gallons of water add two pounds of sulphate of copper and two-and-a-half pounds of common washing soda. This spray may be used with an ordinary garden syringe, taking care that as much of the underparts of the leaves are reached as is possible. When the haulm is heavy with the moisture, turn it back along the rows and spray the undersides.

The haulms of potatoes planted in shady places always grow to a great length. Stake the rows at each end and run a double line of stout string from stake to stake to fix up the haulms between the lines. Do not arrange the string too high or the haulms will work through.

Do not dig up the entire roots of early and main crop potatoes and waste hundreds of marble-like specimens. Gently lift a few roots, take out the largest tubers, and press the plants into place again.

In Canada it is a common practice to remove some soil from the sides of the plants and to grope round with the hand, removing the larger specimens without disturbing the plants in the least.

Lifting Potatoes. The condition of the haulm is the best guide as to when to lift potatoes, but the time is long past when it was considered good gardening to wait until this had died right down. As soon as it loses its fresh, upright appearance and turns yellow the potatoes should be lifted.

Gardeners of the old school seldom lifted potatoes cultivated for winter use until the haulm had died down, but of late years potato diseases have been so on the increase that it is safer to get the crop lifted as soon as the tubers are ripe, *i.e.*, when the haulm has partially died down.

On no account should potatoes be lifted in wet weather or in very fierce sunshine, and the sooner they are out of the light and under cover the better. Sunshine turns them green and unfit for food. Choose a dull day after fine weather if possible.

Store in a perfectly dry cellar or in an attic which is dry and frost-proof. If there is any doubt on the latter point, cover them with sacks. Do not take more out of the ground than you can comfortably get quickly under cover. If potatoes are left lying about for any length of time, greening takes place and they are spoilt for food, though they are alright for seeds.

Nothing is gained by leaving potatoes in the ground after the haulm is yellow. On the contrary, if heavy rains follow a drought this often does a great deal of harm.

When lifting potatoes or any other root crop, press your tool well below the roots and do not work too near them. The slightest scratch is so obviously fatal to beetroots that they are treated with a certain amount of respect, but amateurs jab and stab other roots unmercifully. To wound the tender flesh of vegetables sets up inflammation and disease, and you would see horrible germs if, after a short time, you looked through a magnifying glass at a wound made by a careless fork or spade, and diseased crops will not store.

If there are any signs of disease among the potatoes, nothing should go into the ground until it has had a good dressing of lime. All potato haulm should be burnt immediately.

Saving Seed. Don't save your own seed unless you are sure they are fairly immune from disease. It is almost impossible to guarantee a potato being immune from the many diseases that attack it.

If, however, there are no signs of disease, and one is experienced enough to judge a small mature tuber from an immature one of the same size, then save seed from any particularly fine healthy-looking roots. Immature specimens can be distinguished from mature specimens by the thin skin of the former. Experts, however, are unanimous in their opinion that to save seeds of any vegetable from the same stock year after year will result in diminishing crops, and this is especially true as regards the potato.

Potatoes to be kept for seed cannot be stored in sacks or clamps like those to be used for cooking. They must be spread out on the shallow trays in which they were sprouted, or placed in dry boxes, or on the floor of a dry, frost-proof shed or attic.

Some potatoes sprout far too early to plant in a climate like ours, but in the hands of an expert seedsman this can be dealt with.

Potatoes should not be placed together in great bulk until the cold weather sets in, or they may start to sprout through being huddled together. Not more than two bushels should be placed in one sack or basket, and if they are spread on the floor, they should not be covered with anything heavy. The late crops may be stored in greater bulk, but if barrels or boxes are used, which must stand on the ground, they should be placed on bricks out of the damp and be well protected overhead. The contents of the barrels should be constantly overlooked, as a few decayed tubers will affect many.

Potatoes should never be stored in a wet condition, or with wounds made by the fork, or with disease of any kind, however slight. Sprinkle lime or flowers of sulphur among them in case of stray germs, and exclude light as much as possible.

The greatest care should be exercised in storing potatoes for cooking. They should be freed from all soil, as it may contain insects which will feed on them. The skins should be quite dry before they are stored, and they should be placed in sacks or barrels. If neither sacks nor barrels are obtainable, clean and dry as advised, spread the potatoes on the floor of a dry attic or dry shed, and cover them with a thick layer of clean straw. In all cases the potatoes must be in the dark.

If seed is saved, it should be stored in shallow trays as used for sprouting them. Lids of old cardboard boxes do splendidly, and the seed should be covered until it is time to sprout it.

Large quantities of potatoes to last through the winter may be made into a clamp. A trench should be dug and a thick layer of dry straw placed at the bottom of it. The potatoes should then be piled up in a ridge covered with clean straw, then with a layer of dry soil, and the whole beaten down. Don't forget to make a few holes for ventilation.

Early Potatoes in Pots. Any pots of fair size, say ten inches or larger, may be used for growing a little crop of early potatoes, if one has a warm greenhouse. Soil that has been used for chrysanthemums will suit them if a little well-rotted leaf mould is added to it. The seed or sets may be started in small pots, as less room for the time will be occupied. No drainage for the little pots is needed, as the plants will be shifted before there is much rooting, but the big pots must be well drained. When the tubers are well started half fill the big pots with soil, and then stand them in some place where they will get well warmed through—in front of a kitchen fire would do. When this is done, turn out the plants from the small pots and place one in the centre of each big pot, lightly covering the root with soil until growth is about a foot high, when the pot may be filled, but without any undue pressing down of the soil. After planting, water gently with tepid rain water from a rose can, and place the pots in a light airy position, but be quite sure they are in no draught. Do not water again until the soil shows it needs it. If allowed to get too dry when the tubers are swelling, their skins will set and the crop be a failure.

Plant at the end of December onwards in good loamy soil to which a liberal sprinkling of wood-ash, or any other burnt rubbish, has been added. Everything used should be absolutely clean and free from insect pests. The drainage crocks should be well washed and the soil spread out evenly with the hand to detect insects. It is quite a good plan to bake soil before using it.

Unless your mould is fairly good it is wise to buy some loam. It is quite cheap.

Pots smaller than ten inches should not be used.

Having placed in the drainage crocks, half fill the pots or boxes with the loam and wood-ash, then plant three well-sprouted sets in each pot. Plant with care, sprouted end upwards, and there should not be more than two sprouts left on each set; all others should be gently rubbed off.

Do not fill up the pots entirely until growth has fairly started, and then do the job very carefully to avoid injuring the young shoots, which are very brittle.

May Queen is one of the best varieties for greenhouse culture, as the haulm is rather dwarf, and often with potatoes the less there is above the soil the more there is underneath.

Cover the sets with soil to within two inches of the rim of the pots, press it down lightly and place the pots as near the glass as you can. Sets may be planted in boxes in the same way, allowing nine inches between the sets, and if the boxes are wide enough to hold more than one row, there should be from sixteen to eighteen inches between the rows.

There should be very little water given until the haulm is well forward and the tubers begin to form, but all the time there should be an abundance of light and a nearness to the glass, or the haulm will be drawn and the yield poor.

For a greenhouse crop Arran Mascot is a fine sort, though rather expensive. Sharpe's Victor and Myatt's Ashleaf can always be recommended.

Greens between rows of late Potatoes. Unsuitable greens are frequently planted between the rows of late potatoes. Low growing cabbages do not stand a chance of getting sun and air, they are so smothered with the potato haulm. Where this great mistake has been made it is better to sacrifice one row of greens and to bend the haulms of two rows of potatoes to face each other, leaving the centres of alternate rows free for the greens to obtain sun and air.

The only suitable greens to plant between potatoes are broccoli and kale. Brussels sprouts, large savoys, and cauliflowers all need too much space and nourishment. They should have a plot to themselves.

To propagate Potatoes from Haulms. When haulms are too thick on the late potatoes it does them no harm to remove a few shoots from each plant. If there is a bit of root attached, and they are planted and well watered right away, these shoots will all yield.

To have new potatoes in October plant some late kinds unsprouted early in August in a dry border in rows two feet apart. Old potatoes placed with a very little soil in a shed at the same time will yield small new potatoes about Christmas.

Potatoes with holes in them. If, when cutting potatoes for cooking, healthy specimens are hollow inside, it is because they were grown in soil too rich in *humus*, that is, decaying organic matter. Plant cabbages or any other greedy subject on the site.

Exhibiting. If potatoes are wanted for exhibition, treat them very carefully, as the skin takes some time to harden, and is very easily damaged when the potatoes are first taken from the ground. Select those for show that are most of one size and perfect in shape, and they should be quite free from soil. Place them in cold water, when the earth will fall away from them, and then dry without rubbing them. Pack them in a tin box in bran or sawdust, so that they do not touch each other.

Potatoes, like all vegetables, look well when staged with a background of black velveteen. It is not size alone that counts. Smaller specimens that are flawless as regards the ravages of insects, and perfect in form, are more likely to gain a prize than specimens with only bulk to recommend them.

Black Scab or Wart Disease. The tubers are attacked, small wart-like excrescences forming on their surface, especially round the eyes. The foliage grows so vigorously that diseased plants can often be distinguished by the extreme greenness and robustness of their leaves.

Potato Stem Rot. The stem shrivels from the base upwards till the whole plant is in a rotting condition. In the case of a few plants so attacked remove them carefully and burn.

Wart Disease. A most serious disease, as it is very contagious; it was introduced from the Continent. Distinguishable by excrescences on the tubers which swell into a black mass. There is no known remedy. The crop must be burnt and the ground dressed with gas lime. Disinfect all tools. Even if growing potatoes are immune from this disease, it is a sound plan to dust every tuber, before planting, with flowers of sulphur. See that all eyes are well filled. This sounds troublesome, but it has been proved the best preventive of this terrible disease.

Potato Blight. This is the commonest of all potato diseases and very prevalent in a wet summer. Distinguishable by the brown patches on the leaves, which spread rapidly. Pick off all affected leaves immediately and carefully in order to avoid scattering the spores. Burn them. The better the seed, and the better the cultivation the potatoes are given, the less liable they are to this disease. Overcrowding is a very common cause of potato blight. Potatoes need all the sun and air they can get.

This fungus is one of the potato's worst enemies. The leaves curl up, and there are raised blotches on both the upper and under surfaces of the leaves, as well as brown discoloration. The tubers may not suffer if the weather keeps dry, but the haulm which is badly affected should be cut off and burnt, and the crops should be sprayed at once, as this disease spreads rapidly. No seeds should be saved from such plants in case of carrying infection.

Potato Leaf Curl. Distinguishable by the small size of the leaves, their curled edges, and black patches on both leaves and stems. Very prevalent during the last twenty years. Scotch and Irish seed are both nearly always immune from this disease. There is no known remedy for it. All the affected plants must be lifted and burnt.

Potato Scab. Distinguishable by rough scabs on the tubers. The various authorities are not agreed whether it is a fungus growth owing to some insect pest in the soil, or corrosive substance in the soil. Potatoes with scabs on them are quite wholesome though they naturally do not command such good prices as clean-skinned potatoes. As a matter of fact it is well known that the flavour of scabbed potatoes is excellent. This is perhaps the only disease in which the ground should not be limed, for lime encourages potato scab. It is a good plan to sprinkle flowers of sulphur along the trenches when planting, or to immerse the sets in formalin before planting. Allow one pint of commercial formalin to thirty gallons of water. Immerse the sets for two hours in this solution and then leave till dry before planting.

Potato Winter Rot. Usually the result of storing in badly ventilated clamps, or in a damp warm place. See that the potatoes are perfectly dry before storing. Potato clamps should be very dry at the base, and there must be proper ventilation.

RADISH

RADISH. *Raphanus sativus.* Annual. Indigenous plant in both Europe and Asia. Radishes began to be commonly grown in this country in the sixteenth century.

Radishes should not be attempted except on a warm dry soil. There is no particular food value in them, and unless they can mature quickly in light dry ground they are not worth eating, being either woody or pithy.

Those who like radishes should make successional sowings, for many radishes on the market come from Holland, and pristine freshness is not their long suit.

If radishes are wanted for autumn use, sow the long red form on good ground and in well-moistened drills if the soil is dry. With good management radishes, like lettuces, can be had for the best part of the year.

A very rich soil is not necessary for them, but it should be well dug and friable, and the bed should be in a warm situation, as the more quickly radishes are grown the better. Grown under unfavourable circumstances they are flavourless and pithy.

Sow the seeds broadcast very thinly and cover lightly. Water directly after sowing in dry weather.

Many country gardeners make a sowing of radishes on the potatoes if they are in a sheltered place. The radish growth protects the tubers from any late frosts, and they are cleared before the haulm of the potato is far advanced.

If birds abound, protect the seed with a few pea sticks and black cotton.

Early Rose is one of the best varieties to grow.

Winter radishes for salads can be grown quite well in a box, but it must be at least nine inches deep. Use a compost of old manure, loam, and rotted leaf mould, and sprinkle the seedlings with a mild fertilizer now and again.

RHUBARB

RHUBARB. *Rheum rhaponiticum.* Hardy perennial. A native of southern Siberia, and introduced into this country in the sixteenth century.

The ground should be thoroughly dug three spits deep, and the bottom spit liberally enriched with manure.

Plant in December (if possible) or February, and allow four feet between the plants each way. Nothing is gained by crowding rhubarb plants.

Rhubarb likes a stiff moist soil, and will flourish in part shade. It does very well under apple, or other fruit, trees.

Champagne is a well-known early variety, but Early Albert may be pulled some weeks before Champagne. Dawes' Champion is good, both in flavour and colour, for a mid-season clump, and Dawes' Challenge for a late variety.

Some of the rhubarb crowns should be taken up and replanted every three years. If a new home cannot be given them, the site should be well dug over and heavily enriched with manure. December is the best time for this job. If left till the spring, the new shoots are bound to be checked and possibly injured.

Where there is a big round clump, first remove the surface soil with your hands and the help of a trowel. Go carefully to work, as new growth is often very near the surface. Then take the spade and drive it between the clumps in a perfectly upright position and loosen as much of the remaining soil as possible before dislodging the severed roots. The new growth can usually be seen, and avoid injuring it with the spade.

The soil in the new site should be well dug and the manure worked in fifteen inches below the surface, and each clump set right in the middle of a hole and firmly planted. Take special care that the crowns or new growths are above the ground; they are very apt to get buried too deeply during the work of dividing and replanting.

Clumps of rhubarb that do not need replanting should be enriched by taking out some spent soil from all round the roots and replacing it with a bank of rich manure. Rhubarb should be heavily manured in the spring. When rhubarb has been manured with very strawy stuff, and the rain has washed the straw almost clean, leave it where it is, as it will act as a mulch later on if drought sets in.

Much of the top growth of rhubarb decays in the autumn. This should be removed from the beds, and a dressing of rather fresh manure placed round the roots.

Rhubarb is a greedy feeder. Nip out all flowering heads from rhubarb beds as they take a lot of nourishment from the plants. Take them out from the base.

Rhubarb to be forced should be taken up early in October and left as it is in a dry spot to be exposed to the weather and slight frosts. This will induce very quick growth once the roots are in the dark under cover. It gives the roots a check and has much the same effect as if they had passed through a mild winter, and prepares them for forcing when replanted early in the new year. When there is not time for this some roots can be forced later where they are by heaping up straw round them and covering the whole with an old hamper or drain pipe. Only well-established, vigorous roots can stand forcing. It should never be attempted with young or newly-planted clumps. Roots to be forced should be three years' old, for they must be robust.

To maintain a succession for a small household, lift two roots at intervals of a month; this will yield sticks as long as forced rhubarb is required. Dig up a couple of roots, place them on a little soil in any old box, and fill in all round the roots with fine soil, without actually covering the crowns. Damp the soil if it is not naturally moist with tepid water (rain water if possible) and place the box in any warm corner, covering it with pieces of wood or old sacking to exclude the light. All one has to do is to keep the mould fairly moist, and many of the sticks will soon be long enough to pull.

Whether forced or otherwise, rhubarb should never be cut: it should be sharply pulled out from the base.

Forcing rhubarb can be done almost anywhere. If in a dark cupboard or cellar, place the box on an old tea tray or something that will hold any water that drains through.

Rhubarb can easily be forced out of doors to produce sticks by the end of December. At the end of November place an old tub or box over the selected crowns, and make a hole at the top for ventilation. Then bank up the sides of whatever is used with anything to hand that will ferment. Rotted manure is of course best, but there is great warmth in decaying leaves, and if used they should extend as far as possible beyond the article covering the crowns in order to generate warmth for the oncoming sticks. To keep up the supply, cover several roots every three weeks.

To increase the length of Rhubarb Sticks. Cover each crown with a good heap of hay or straw, and the stalks will grow up through it until they are twice the height they would otherwise be.

SALSIFY

SALSIFY. *Tragopogon porrifolius.* Hardy biennial. A native of northern Europe.

Salsify likes a rich light soil, and on a heavy soil it is best to adopt the boring system (see under Carrots).

Salsify should be grown in deeply trenched ground and with rich manure on the bottom spit, but no manure in the top spit. Ground on which celery has been grown is excellent for salsify.

Sow the seed in April in shallow drills quite fifteen inches apart. Thin carefully when the seedlings are an inch high. The final thinning should leave them a foot apart. A second sowing may be made at the end of April.

Keep the hoe going between the rows, but otherwise salsify needs little attention. The crop is ready in October. The roots must be lifted carefully, or they will bleed from broken parts and lose flavour.

Store in sand in a cool dry place. Salsify, if left in the ground, will send up flowering stems the following spring known as chards. These can be cut when five or six inches high and cooked as asparagus.

SEAKALE

SEAKALE. *Crambe maritima.* Hardy perennial. Native plant, but has only been in common cultivation since the end of the eighteenth century.

With proper care seakale will grow in almost any soil, but thorough preparation of the soil is essential. Seakale is a very deep-rooting plant, and the soil must be dug three feet deep, and manure liberally incorporated in the bottom spit. In the upper spits incorporate mortar, rubbish, and wood-ashes.

Propagation by root cuttings or " thongs " is the best method of growing from seed. Plant the seed in March or April, one inch deep in drills twelve inches apart, and firm the ground thoroughly after planting.

Thin to six inches apart. The following spring lift, cut off the tops below the crown, and transfer to permanent quarters.

To propagate from thongs take these about six inches long from the side roots. For permanent beds plant three thongs six inches apart in a triangle. Allow two-and-a-half feet between these stations and four feet between the rows. The crowns should be about one inch below the surface. Put ashes round each thong. Reduce the shoots, leaving only the strongest.

Robust growth is essential in seakale culture, and the plants must be kept abundantly supplied with moisture and liquid manure. Soot is also beneficial.

Do not attempt blanching the first year. Cut out all flowering stems when they appear. In the following November place ashes over the crowns. Place seakale pots over each group of crowns and a sufficiency of leaves piled over the pots to create a temperature of about 55 degrees. Seakale forced " naturally " in this way will be ready from Christmas onwards.

As long as it is in perfect darkness seakale can be forced almost anywhere; even in boxes in a fairly warm cellar. Plant in boxes as in the open, in soil consisting of well-sifted old hot-bed manure and light rich soil in equal quantities, and a little air-slaked lime. The soil must not be too wet. Cover with dry soil or coconut fibre. Do not over water, but at the same time there must be a sufficiency of moisture. The heads should be ready in about five weeks.

SCORZONERA

SCORZONERA. *Scorzonera hispanica.* Hardy biennial. A native of southern Europe, and introduced into this country in the sixteenth century.

If sown too early, scorzonera is apt to run to seed prematurely. Otherwise treat exactly as for salsify (including adopting the boring system). Scorzonera is not injured by frosts, and therefore may either be lifted at the end of September and stored in sand in a cool dry place, or lifted and dug as required.

SAVOYS

SAVOYS. *Brassica oleracea bullata major.* Hardy biennial.

Successful cultivation of savoys depends on growing them in deeply-dug, rich, firm ground. If there is rank manure in the soil, the result will be loose, instead of compact, heads.

Plant the seeds from the middle of March to the middle of April, and plant out the seedlings early. Planting out seedlings early, and treating them with the utmost care in the process are of vital importance with everything of the brassica tribe. In planting out, leave from fifteen inches apart and eighteen inches between the rows for the smallest varieties, but for the larger sorts two feet apart each way is none too much. The flavour of savoys is best after the first early frosts have set in.

SHALLOTS

SHALLOTS. *Allium ascalonicum.* Hardy bulb. A native of Palestine, and introduced into this country in the sixteenth century.

Like onions, they may be grown for years on the same piece of ground. They dislike heavy damp soil, but like an open sunny position and light rich soil.

Shallots are conspicuous by their absence in most gardens, yet they are of the easiest cultivation; they store well (it is quite the exception for a shallot to go bad), they can be used in place of onions in most cookery, and they make an excellent pickle, far superior to the onion in flavour.

Their yield is splendid, as either from Small or Giant the return is never less than eight to a dozen from each bulb planted. Shallots will flourish in almost any sunny spot, and the Giant yield enormous clumps, each containing quite a dozen good-sized cloves.

Always plant from bulbs, as when grown from seeds they do not come true. In good soil and in warm gardens plant early, *i.e.*, February. On heavy soil, and in gardens with a northern aspect, plant in late March or even in April. Whether you plant early or late, keep an eye on the seed. If kept in too warm a place it will shrivel and be worthless. If in a damp place, it will sprout and all the goodness go in green shoots.

It is a rare thing for shallots to rot, but if lifted in wet weather they should be overhauled occasionally. They should be spread out so that they do not touch each other.

Select perfect single bulbs for planting, and not those composed of many cloves hidden under a single outer skin. Plant the bulbs in rows one foot apart, ten inches between the bulbs. Many people give only six inches, but ten inches gives splendid returns. Allow half the bulb to be above the ground—and press the earth firmly round it.

Shallots should never be earthed-up, but overlooked after every frost which is most likely to push them up out of the ground. As they begin to mature the soil should be drawn away from them to allow the sun to ripen them.

It was the rule with many old-time gardeners to plant shallots on the shortest day and lift the crop on the longest day. If planted in February, it is just as well to look them over until they have firmly rooted. Birds sometimes lift them right out of the ground, thinking, no doubt, that the brown tag would make a very nice little bit of building material.

Give a frequent dressing of old soot to shallots if you want large bulbs; it also helps them to mature early. Salt and soot are both good manures for shallots, but salt must always be used with discretion for all vegetables. If the soil is naturally moist it only makes matters worse. It is best not to use it except on light dry ground, or on heavy ground in time of drought.

Shallots, when ripening, should have their greenery bent over in the same way as onions.

In lifting the shallot crop it is a good thing not to leave the bulbs on the ground to ripen, but to tie them in bunches and sling them over a fence or rail. Don't take up shallots too early, but at the same time don't leave them in the ground long after they are ready. When the stalks have turned yellow they are not likely to grow any bigger. Leave them for a day or two in the sun to dry thoroughly. Even then they should subsequently be spread on a sack on the floor of a shed, or some other place under cover, in order that the air may thoroughly dry them. They should be stored in baskets or net bags, as they need air. Shallots will keep the year round.

SPINACH

SPINACH. *Spinacia oleracea.* Hardy annual. A native of the East, and introduced into this country in the sixteenth century.

Moderately light soils are best for spinach, but it will give good results on any rich soil. Make the first sowing on a warm border in January, sowing the seed one inch deep in drills one foot apart. Make successional sowings at intervals of a fortnight.

If spinach seed is soaked in water for twenty-four hours before sowing it will germinate more quickly and make stronger growth. Do not soak seed for the very early sowings. Early thinning to a foot apart is essential, as otherwise the plants run to seed almost immediately and give such poor leaves that they are hardly worth picking.

Spinach seedlings transplant quite well if quickly done. Spinach likes a cold wet summer, and in such a summer the crop is magnificent. This shows that what it needs in hot weather is mulching, and, if possible, copious watering at intervals. Mere surface watering is worse than useless.

In gathering spinach pick big leaves from each plant. Don't denude some and not touch others, and as soon as the flower stems appear cut them off.

PRICKLY SPINACH. It is widely believed that prickly spinach should be grown in winter and the round seeded in summer, but the one sort is just as hardy as the other. It was prickly spinach which gave the plant its name, and in olden days this sort was grown all the year round.

Sowings of prickly or winter spinach should be made from early in July to the end of September. It is not much good to sow in ground near towns or in cold districts after August, but in mild southern places October is not too late.

The seed of prickly spinach is quite different from the summer variety. Each separate particle is, in fact, a cluster of seeds, and they may produce three or four plants apiece, and therefore the seed must be sown extra thinly.

Those who do not care for prickly spinach should, in preparing for cooking, lay each leaf flat and cut out the rib. It will then be as tender as summer spinach. Prickly spinach should be thinned early to nine inches apart. This is more space than is usually allowed, but one obtains a very much finer crop. Cramped spinach of every variety is very likely to bolt.

PERPETUAL SPINACH OR SPINACH BEET. *Beta cicla var.* Hardy perennial.

Although perpetual spinach is really a variety of beet, the root is valueless. These vegetables should be cropped as soon as the growth is big enough to make a boiling. Perpetual spinach especially should be frequently cropped, taking a few of the biggest outside leaves at a time from each plant. Perpetual spinach that is doing badly should have all but the smallest leaves cut away. Stir the surrounding soil with a hand-fork and give a dressing of spent soot. The plants will recover after this treatment.

The mid-rib of perpetual spinach resembles seakale in flavour, and the rest of the leaf can be used as ordinary spinach.

Perpetual spinach needs to be carefully watched for slugs in the autumn. They naturally love dense moist foliage and will often eat right through the succulent stems unless routed out. Hand-picking them out is not sufficient, for many are so small that they are overlooked. The rows should be dusted with old soot and the hoe freely used, as birds are always on the look-out for slugs and other pests brought to light by the hoe.

New Zealand Spinach. *Tetragonia expansa.* Hardy perennial. A native of Australia and New Zealand, and introduced into this country towards the end of the eighteenth century.

On hot dry soils, and especially if deeply cultivated, New Zealand spinach is very satisfactory for summer crops, but it does not like a heavy soil. It cannot endure any frost, and for early supplies seed must be sown under glass in March and set out at the end of May.

Sow seed in the open in the middle of April, in shallow drills three feet apart. Thin to two feet apart in the rows. This sounds a big distance, but the growth of New Zealand spinach is quite different from ordinary spinach. Each plant makes a number of spreading stems, each two to three feet long, and if cramped the results are poor. The leaves are not picked singly, but the tender shoots are gathered. Like the true spinach this plant likes deeply-dug, well-enriched soil, and mulching in hot weather is beneficial.

SWEDES

Swedes. The garden swede is a moisture-loving plant, and should be put in the dampest part of the garden. Those sown in a position that is exposed to much sunshine should be well watered, otherwise the crop will be weedy. Sow in May, and treat exactly as for turnips.

TOMATOES

Tomatoes. *Lycopersicum esculentum.* Tender perennial. Native of South America, and introduced into this country towards the end of the sixteenth century.

It is, however, only since about 1850 that it has been commonly grown in this country.

Planting Tomato Seeds. Choose a sort that bears prolific, medium-sized fruit. Sow very thinly, and keep the soil fairly dry. Seedlings come to grief in soft wet soil, and especially if overcrowded.

The compost must not be too fine, for tomatoes make strong growth and like a soil that will not give when they attempt to cling to it. A rather rough loam with a surface dressing of wood-ashes is ideal for their first home.

Plant tomato seed in a compost of one part loam, one part well-rotted leaf mould, and a little sand, with no manure of any kind.

Some experts recommend the following method of sowing the seed:

Sow the seed singly, about two inches apart and three inches deep, in a fairly rough compost. The seedlings so planted grow strongly from the first and, like bigger tomato plants, they need something firm to cling to. Very fine soil would "give" too much.

Tomatoes do not need a very rich soil. It is a sound policy to starve them into flower and then, when the fruit has set and also begun to swell, to feed regularly with weak liquid manure once a week. This method, combined with giving them plenty of air (but not draught), gives abundant crops, whereas rich soil and too high a temperature are the causes of many failures.

It is essential to give tomatoes under cover plenty of air. A close moist atmosphere will set up all kinds of tiresome diseases in this plant. A dry atmosphere is essential when the flowers are setting. No fruits or vegetables under glass should be syringed while they are in flower.

When buying tomato plants see that they do not have very much space between the points in the stem where the leaves are thrown out, for this shows that they have been overforced. Buy short stocky-looking plants. Overforced tomatoes, marrows, and cucumbers have a weedy look, and there is great length of leaf stem, the leaves themselves being very pale. Healthy plants should be short and low-growing, and the leaves a full rich green.

When any plants come through the post, they should be placed in a mixture of soil and water for an hour or two before planting.

Where tomatoes are being grown in pots on a greenhouse shelf it is an excellent plan to place the pots on a bed of old manure or decayed leaves. The plants will not require so much watering and the roots, instead of getting pot-bound, will very likely work their way into the material beneath the pots and find extra nourishment.

Indoor tomatoes bearing heavily should have a little extra attention, as in pots or boxes the small quantity of available soil is almost drained of its goodness.

In the days when motors were scarce road sweepings were excellent, but now they are harmful, and especially so when roads have been recently tarred. Weak manure water twice a week is the best stimulant to give indoor tomatoes.

To help oncoming fruit the tomatoes should be picked a day or two before they are fully ripe. Wrap each fruit separately in paper, place in boxes, and keep *in the dark*. This is a far better plan than leaving them on window-sills or on the kitchen dresser.

The modern system of removing leaves to ripen the fruit quickly is more than questionable. It is all very well for market purposes when the whole object is to get the crop in as early and as quickly as possible, but the flavour is never so good. The most luscious fruits are those which have ripened in partial shade. Leaves are not hard impervious substances, and all the sunshine the fruit needs gets through and round them. Moreover, leaves are the digestive organs of the plants, and to remove them is, therefore, to cut off one of the chief supplies of nourishment.

Pick all tomatoes as soon as they ripen to allow the strength of the plant to go to the fruit coming along. It is unwise to leave any fruit or vegetable on the parent plant once it has reached perfection, for although it is perfect, it must still have nourishment to keep it in that condition. If fruit and vegetables were picked as soon as they are perfect, it would double the crop.

The yellow patches so often observed on tomatoes under glass are caused by overwatering. Mildew, distinguished by a velvety-looking, light brown substance under the tomato leaves, is more often caused by dryness than damp. Look well to ventilation and watering, and spray the plants with weak Bordeaux mixture.

Outdoor Culture. Until recently, outdoor tomatoes as a rule were given too much artificial food and root room. The greatest experts in tomato culture have now proved that they do best in moderately good soil, and with no extra feeding until the fruit is beginning to colour. Gross food and unlimited root-run make coarse stems and foliage and very few trusses of fruit. Many successful growers confine the roots in the open with slates or old bricks.

Outdoor tomatoes should be planted in the full sun, and in a position where they will get plenty of air and light: under a sunny wall, but not too close to it, is ideal.

The time to plant in the open must depend on the weather. The middle of June is early enough in a cold season. Holes should be prepared for them about one foot deep and two feet square, and filled with only moderately rich soil. They must be planted in very, very firmly.

No glass-grown tomatoes have the flavour of well-grown outdoor tomatoes. In rich soil they will give coarse leaves and very little fruit.

The soil to receive tomatoes should be light and warm. If it is of a heavy retentive nature, the plants that have been forced on in a glasshouse cannot be expected to get a good root-hold in cold soil. Good loamy soil with a liberal allowance of well-rotted leaf mould, a little decayed manure, and some sand is a very good mixture. If your soil is sandy, tomatoes will do splendidly planted in it just as it is, but the plants must be liberally fed when the first fruits begin to swell. Feeding fruits before they begin to swell is liable to make them drop.

The ground should be dug over thoroughly some time before it is needed. This will both warm it and enable the birds to clear the insects.

Choose dark green, sturdy-looking plants rather than the lighter-looking weedy ones, and allow a yard between each. Stake the plants at the time of planting, and the soil around their stems should be made very firm, as, like all fruit-yielding plants, they will not bear good crops otherwise.

Discretion must be used in watering, as the plants must be neither too moist nor too dry. Only plain water should be given till the fruits begin to swell, and then give liquid manure about twice a week, either animal manure or Clay's Fertilizer.

All side shoots must be rubbed out as soon as they appear.

If there are no bees about, the pollen must be taken on the tip of a camel's hair brush from flower to flower.

Four or five trusses of fruit are enough for an outdoor plant.

Do not mutilate the plants by removing most of the leaves.

Nothing is gained by putting out tomatoes too early. Better to wait till the middle of June than let them have a set-back. They seldom recover properly from a bad set-back. If convenient, those in pots may be set out in the open during the day if it is sunny and windless. Tomatoes are frequently put out too early, and they rarely recover altogether from the great cold we so often have in May. The fruit flowers which develop the best fruit, and the finest leaves which work up the sap into food, succumb.

The only thing to do with tomato plants that have been checked in this way is to remove the withering leaves, to give protection at the back of the plants if they are in an exposed position (but they should always have the protection of a wall or fence), and to cosset them up with bonemeal, or one of the special tomato foods to be obtained at all nurseries. If the plants recover a bit it is especially important not to maltreat them by denuding them of half their foliage to ripen the fruit.

Each plant will yield several pounds of fruit of a nice size from the main stem, but if the side shoots are given free play there will be any amount of small tomatoes, chiefly skin.

When the blossoms are forming, examine them carefully; the majority will be perfect, like a potato flower in shape, but remove the fasciated ones. These confused looking blooms develop into those queerly-shaped tomatoes which are unsightly and hard to peel.

When four or five bunches of blossoms have formed, push off any more buds; five trusses of fruit are as much as each plant can develop well.

Pinching off the top of the stem is a moot point: some growers argue that it sustains the flow of sap.

In choosing plants for outdoors select those that start bearing bloom low down on the stems, and discard any that are lanky and bearing only one truss of bloom; they will not pay for the room they take up.

Outdoor tomatoes must never be allowed to become root dry, or the fruit will not swell properly. Consequently, when planting them near a wall or fence, put the roots one foot away. It is most important that no roots should be allowed above the surface soil. These should be covered immediately with turfy loam or some suitable compost.

Tomatoes in full bearing should be given weak manure water twice a week until all the fruit is ripe. When the nights turn cold, and there is a possibility of outdoor tomatoes being injured by frost, take a spade and sever the roots close up to the stems of the plants, leaving the plants in the ground. The fruit will ripen very quickly treated in this way, and retain its fresh flavour longer than if it was removed from the stem.

In a wet season, when outdoor tomatoes have done badly, to make the most of the fruit that is colouring, much of the unripe green produce should be removed, but do not take any foliage with it. This very green fruit will not colour if kept in boxes (see above): it should be used to make preserves, pickles, and chutneys. In unfavourable seasons, when outdoor tomatoes have done badly, the very best thing is to take up the plants, roots and all, early in October and suspend them under shelter in a cool but frost-proof dry place. The sap in the plants will help ripen the fruit for weeks to come, and until it has died away, which takes many weeks, the fruit remains fresh and full of flavour.

White Fly. Once established, this fly attacks apparently in millions, for they rise like a cloud when disturbed. The undersides of the leaves are attacked, and the fly should be hand-picked off in the earlier stages. Vaporize three nights a week with nicotine solution till the pest is eradicated.

Potato Disease. Common in cold wet summers. The symptoms are exactly the same as in potato blight (*q.v.*). Spray with Bordeaux mixture. If the mixture has to be used in the late summer, the fruits must, of course, be washed and wiped before using.

Sleepy Disease. This attacks the stem, and by cutting off the supply of sap, the plant is gradually killed. There is no known remedy, but fortunately it is not a common disease. New varieties of tomatoes are hardly susceptible to it, but overwatering and too much animal manure are sometimes responsible for it.

TURNIPS

TURNIPS. *Brassica rapa.* Hardy biennial. Native plant found in damp places, but we owe the improved garden variety to the Flemings.

Turnips will grow in almost any soil with the exception of a thin soil composed chiefly of limestone. This kind of soil abounds in seaside gardens, and it should be enriched with good rotted manure if turnips are to grow in it, but there is no need to add artificial manure as well. Soils that contain hardly anything of a limy nature should have bonemeal or old mortar rubbish added. When the house decorator is at work there are many oddments of mortar rubbish, cement, etc., taken from walls, ceilings, and other places under repair. Such rubble crushed fine is ideal for soil deficient in lime, or for soil which errs on the heavy side.

Always sow turnips in drills. To sow them broadcast invites the turnip fly. Seed may be sown from January to August; the August sowing being the winter crop. The first crop should be sown in the very warmest position you can give it in deeply-dug, moderately rich soil. After sowing, make the soil very firm with the back of the spade. Firm soil induces bulbing.

Sow on a fine sunny day in drills half an inch deep for early crops, one inch for late, and sow very thinly.

Begin thinning out as soon as the plants appear, and let the final thinning leave the plants nine inches apart. This is none too much. Keep all weeds under, and the hoe going regularly.

The lighter the soil on which turnips are grown the more attention they will need as regards watering and mulching.

Turnips should be thinned drastically: there is an old country saying that no man shall be allowed to thin his own, because he would not have the heart to take enough to ensure the remaining crop coming to perfection. Unless turnips are thoroughly thinned their leaves, which are long and spreading, intermingle so thickly that neither air, nor rain, nor sun can possibly get to the bulbs. Thin as soon as the first rough leaves appear, and the final thinning should leave them from five to ten inches apart. If two or three plants are found together, the shortest should be left, as this is probably the strongest.

Seed sown on the right soil as suggested above will germinate very quickly, and if thinned as turnips should be thinned, first roughly with the hoe, and then singly by hand until the roots are from five to ten inches apart according to variety, the crop should be a success.

Turnip leaves are decidedly low-growing, and fall around the roots almost flat, and as so much food is prepared in all leaves for the benefit of roots, it is essential that all the foliage of vegetables should not be cramped for room.

Should severe weather set in after the seed is above ground, cover the bed with that excellent stand-by—lengths of old muslin curtains or any light covering. Turnip seedlings will stand some frost, but not a long one.

It is well worth while in the south to make a first sowing of early turnips in January and protect as above. Even when the roots are little bigger than a comely radish they are full of flavour, and turnips from abroad are very dear and flavourless, having often been out of the ground for a long time.

For soups and stews small home-grown turnips may be used, scrubbed and unpeeled, for the most pungent flavour is in the peel, which, in its early stages of growth, is not coarse.

When leaves of turnips are riddled with holes it means that the turnip fly has been at work, and there should be constant dusting of soot between the rows, first watering the soil. If the damage is not checked the crop will be very poor.

The turnip fly does not care for the leaves after they become rough. It is the smooth, seed-like leaves it likes, so the chief thing is to guard them in their nursery stage and to encourage quick growth.

As soon as the plants are well above the ground sprinkle them with slaked lime until they look white, and the job must be done in the early morning, otherwise it will be useless. The lime will benefit the crop besides keeping off the fly. When plants have become infested a simple device used by many seed merchants is to put a broad piece of newly-painted white wood between the rows. The insects, which are more like jumping beetles than flies, are so attracted by anything light that they hop on to the board and stick to the paint. The wood will sometimes be found almost black with them.

Where practicable, turnips should be given thorough soakings in dry weather and very mild liquid manure after a soaking of pure water.

In sowing turnips for use in August, choose a cool position, and the turnips will be less susceptible to attacks of fly. Occasional dustings of spent soot will be beneficial if applied when the plants are damp.

The more quickly turnips can be grown by the help of these things, or by mixing some very well-rotted and sifted manure or wood-ashes with the surface soil, the better for the crop; for the earlier the seed leaves appear the less likely they are to be attacked by the turnip fly and other insects, which are always on the look-out for the delicious sweetness to be found only in the malted seed-leaves. Yellow turnips are the best for late use as they stand the frost better than the delicate white varieties.

Winter turnips must be kept quite free from fallen leaves and other rubbish, or the crowns of the roots will rot. Turnips, like parsnips, will stand the frost, and may be dug as required until November, when they should be lifted and freed from all soil, and perfectly dried before storing.

Storing. Spring- and summer-sown turnips will store for a short time, but they shrivel to some extent. Remove all greenery and the tap roots, and store in fine dry soil or sand, or even ashes, in a cool dry place.

Autumn-sown turnips for winter and spring use may remain in the ground to be pulled as required, unless the soil is waterlogged, and then they are best lifted.

Turnip Root Gall Weevils. See Cabbage root gall weevils, page 34.

Turnip Beetle. Owing to its jumping powers sometimes called the turnip flea, but it is a beetle. All weeds of the cruciferous tribe are a feeding ground for the turnip beetle till the turnip crop is large enough, and therefore these weeds should be vigorously exterminated. The grubs attack the turnip leaves which should be dusted with soot when the dew is on them.

VEGETABLE MARROWS

VEGETABLE MARROW. *Cucurbite pepo ovifera.* Half hardy annual. Although the original habitat of the gourd is known, that of the marrow is unknown, nor do we know when it was first grown in this country.

It is the custom to raise marrows under glass and to plant them out, in spite of the fact that marrows raised from seed sown in the open are invariably finer and more productive plants. Marrows, like cucumbers, detest root disturbance. Instead of raising marrow seedlings under glass, try the system of sowing them in the open in the middle of May, and you will not regret it.

If raising under glass, use clean flower pots and well-washed crocks for drainage. At the bottom of each pot place a little fresh manure and fill up the pots with good loamy soil, and place seeds upright, not flat, about two inches deep, and cover in lightly. Never allow the soil to become dry, water with slightly tepid rain water if possible, and keep the plants in the warmest corner of the greenhouse.

When four rough leaves have formed the plants may be placed in the open, but only if the weather is favourable. From the middle of May to the beginning of June is the right time, and if cold winds and late frosts are about, leave it till even later and give protection at night. Shade the plants for the first few days; guard them at night with flower pots, and keep them well watered; also sprinkle some insect destroyer round them or make a ring of very coarse ashes, otherwise slugs will eat right through their fleshy stems.

Three conditions are necessary for marrows if you want perfection. There must be some bottom material that will generate heat, either fresh manure or manure mixed with rotted leaves, grass cuttings, etc. A really good soil must be placed on top, and plenty of water must be given.

In forming the home for the marrow the manure, soil, etc., should be in just the same order as in the pots for the seed. It is an excellent plan to plant marrow seeds straight into the bed, provided they are shielded at night or during cold winds with any temporary glass protection. Under favourable conditions they always do better than transplanted marrows.

If sowing marrow seeds straight into the ground, "frame" them with any bottomless box covered with glass or one of the excellent glass substitutes now on the market, the frame being removed when weather permits. There is always a certain amount of time wasted both over the actual job of transplanting and the throwing-back of the plant, so if one can sow crops to go straight ahead one should.

The plants must be at least four feet apart and have their chief stems trained in different directions.

There are two methods of growing marrows; one is to plant them on raised mounds or heaps, and the other is to prepare sunken beds for them. The latter is the more modern and possibly the better.

A mound of rotten garden rubbish on which marrows are to be grown should be made perfectly flat at the top. Make a deep hole in the centre, and fill with a mixture of manure (at the bottom), rotted leaf mould, and fine soil. Rotted manure to generate heat is essential for marrows. Prepare a sunken bed in the same way.

Marrows will always run in a southerly direction, so leave plenty of space in that direction for them. The young plants must be protected against too strong sunlight, but far more against late frosts and cutting winds. We often have both the latter in June, and it is not safe to leave them unprotected at night until the weather is settled.

Once the plants are through their infancy they need very little attention. Slugs must be guarded against while the plants are still young enough to have pots placed over them. When covered by the pots put soot round them, this will leave perfect rings round each plant when the pots are removed, and act as an efficient safeguard against the slugs.

Some gardeners advocate stopping all marrow plants when they are about one foot high by pinching out the extreme point. This will encourage the side shoots, but allow only four or five of these to develop; rub out the rest. When the main stems are a yard long they should be pinched off. Marrows left unstopped usually make abundant, long, unfruitful trails, and when there is a lot of unfruitful growth to take the strength from the plant many of the female flowers turn soft and fail to develop.

Most of the flowers first produced on a marrow plant are male blooms. The female blossom shows a tiny fruit at the base from the very first, but it will not mature unless it is pollenized. In places where there are not many winged insects the pollen from the male bloom should be shaken over the fruit-bearing flower.

Nipping back marrows should only be done to the main stem, for lateral or side shoots bear more of the female fruit-producing flowers than the main stem. Inexperienced growers frequently make the mistake of nipping back these side shoots to keep the plant within bounds.

Where marrows are producing freely liquid manure should be given once or twice a week until the end of their fruiting season.

In dry weather in August marrow leaves sometimes mildew badly. They should be cut out and burnt.

If the under-leaves are covered with green fly, powder them with tobacco-ash or spray them with some good insecticide.

Marrows being grown to a large size for winter use should be placed on a piece of slate or glass, or the underside will be very tough and woody. Green marrows are supposed to be of a firmer and less watery texture than the pale yellow varieties. Very large marrows, unless grown quickly, are apt to be woody.

To increase the size of a marrow thread one end of a piece of wool through the stem and allow the other to rest in a jar of water. To keep a marrow well watered in dry weather place one end of thick wool, thin rope, or an old stocking in a vessel of water, and carry the other end to the root of the marrow, where it will slowly drip, keeping the plant moist in the driest weather.

To make the most of a single marrow plant, instead of allowing it to roam at large, taking all its nourishment from one root, peg some of the strongest shoots down at different junctions, first enriching the ground with a little well-rotted manure. Marrow stems are delicate, so peg them down with pronged pieces of wood which should be covered with soil. Roots will soon be thrown out, and each junction will be able to supply its own portion of the plant with food. The yield of fruit will be considerably larger than if the marrow was growing in the ordinary way. Also any portion that has finished bearing can be cut away.

Protecting Marrows in Autumn. If frost threatens, protect the entire marrow bed with old muslin curtains. If the entire bed cannot be managed, cover the roots first. Marrows will endure several days' frosts if so protected, and then continue for probably several weeks if the weather is favourable to ripen fruits. There is nothing like old muslin, as it is too light to do any damage to the plants.

Late marrows should have a piece of slate or wood put under them, otherwise the underskin will become very hard, to say nothing of any number of insects collecting under them.

When cutting pieces from stored marrows, leave the cut specimen in a very airy place for the wounds to dry up quickly.

SECTION III

MANURES

Chemical Fertilizers. Chemical fertilizers are, as a rule, merely stimulants, whereas natural manures contain plenty of organic food. Natural manures develop every part of a plant, whereas chemical fertilizers force one part of a plant at the expense of all the others. The flower or fruit is forced and the roots weakened. Chemical fertilizers are, of course, excellent for annuals, but be chary of giving such things to perennials, which cannot stand the excess of nitrogen usually to be found in highly concentrated fertilizers. The following is quoted from a lecture delivered by Mr. Montagu Allwood before the Royal Horticultural Society:

" An organic food in comparison with a chemical stimulant is like the body-building and lasting qualities of a beef-steak as compared with a whisky and soda."

Artificial Manures. Complete manures contain *humus*—organic food—and are, of course, an excellent substitute for natural manures. But nothing can ever take the place of natural manures. If an artificial complete manure is used, follow the directions to the letter, and don't give little doses in between whiles of other manures.

Care should be taken in buying plant foods to avoid those which do not give a formula certifying that the food contains nitrogen, phosphates, and potash. It is a golden rule that artificials should only be used as occasional stimulants when it is possible to obtain natural manure in any form. It is far safer to purchase one of the complete fertilizers for plants that need them than to attempt to mix the various artificials unless you are experienced.

Do not mix artificial manures till necessary. Some are naturally more moist than others, and these cause deterioration in those that are of a drier nature. Do not use nitrate of soda and sulphate of ammonia together when mixed with other artificials: one is sufficient.

Manures that will not mix are :

Nitrate of soda and farmyard manure.
Lime and farmyard manure.
Basic slag and farmyard manure.
Lime and sulphate of ammonia.
Lime and nitrate of lime.
Basic slag and nitrate of lime.

When applying nitrate of soda keep it near the ground. Even if only a very little comes in contact with heads of cauliflowers it will discolour them. When broccoli, cauliflowers, and other greens are well advanced the ground may be dressed with one ounce of nitrate of soda to the square yard, but on no account with more than this. Give this dressing about once a fortnight while the crop lasts. A light dressing of nitrate of soda may be given to winter lettuces. A light dressing means a mere sprinkling, and it should not be too near the stems.

Coarse-growing cabbages, such as drumheads, may have a top dressing of sulphate of ammonia at the rate of one ounce to the square inch. This will help development in early spring if they are well forward and look healthy. But do not apply the dressing till the turn of the year.

In Southern and Irish gardens onions are sometimes planted out very early, and the soil needs wood-ash and a mixture of four pounds of superphosphate and one-and-a-half pounds each of sulphate of potash and sulphate of ammonia, well mixed and applied about two ounces to the square yard.

Natural manure gives stability to light soil and helps it to retain moisture. It takes the stiffness from heavy soils and warms them up, and without warmth no seeds will germinate. Rank manure must never be applied to growing plants, for it is full of noxious gases, which burn them. Even when well rotted it must not be placed too near the stems of plants, for it encourages unhealthy growth and insects. It should be forked-in some distance from the main stem. This is very important. A ton and a half of manure is about the quantity required for a ten-rod plot of indifferent ground. A good-sized barrow holds about one hundredweight.

It should be remembered that one can quite as often over-manure as under-manure, and often results would be better if the ground were cleansed with lime and other soil cleaners, and not so liberally treated.

Horse manure is best used in a half-rotted condition. If left to decompose entirely, most of the goodness is lost. If left to rot, it should be covered with soil or old sacking to prevent the ammonia escaping.

Save all droppings from hen and pigeon houses, rabbit hutches, etc., and store them under cover in a heap, turning them over occasionally and mixing them with dry soil until the whole is a fine powder. If used in a dry state it should be kept until as dry as powder and then mixed with plenty of good soil before applying. If used as a liquid manure, one pound should be added to about two-and-a-half gallons of water. Place the droppings in a fresh state in an old bag, attach it to a strong stick, and suspend it in a barrel of water.

A spadeful of poultry droppings will be enough for thirty gallons of water, which gives some idea of what a powerful manure this is. Poultry manure must not be applied to the ground in a wet sticky state, nor when fresh. Put it under cover. It should be constantly forked over and spread out, and have fine soil sifted over it, then be heaped up again and treated at intervals in this way, until the whole mixture is almost as fine as powder. This sounds tedious, but it is very valuable manure, being worth about four times as much as stable manure, and eight pounds is quite sufficient for a rod of land.

Liquid Natural Manure. Small quantities of either stable or farmyard manure should be well covered with water and allowed to remain for a few days to settle. The liquid can then be strained and used, one part to twenty parts of clear water, as it is very powerful. Slops from the house should be diluted to the same extent.

One of the chief advantages of manure in liquid form is that the plants can absorb it so quickly, but never apply any liquid manure or any artificial fertilizer mixed with water to any crop or single plant until it has first been watered with rain or clear water. To apply it, however much diluted, to plants with dry roots will do more harm than good. It burns them so badly that they can never recover properly.

Carrots, beet, and parsnips should never be fed with manure of any kind when in growth. Neither should onions be given ordinary liquid manure (see Onions).

Bonemeal. Next to rotted natural manure or decayed vegetable refuse this is one of the safest and most valuable manures to use.

In preparing flower beds for bedding plants give three ounces of bonemeal to every square yard. Most people burn or throw away old bones after they have been used for stock, and yet they cheerfully pay for expensive bonemeal.

If there is no bonfire in which to burn them to make valuable ash, keep any old saucepan for them and boil till they are soft and pitted with holes. They crumble easily in this condition, and it does not take long. Bonemeal dissolves very, very slowly, and therefore it is just the stuff to give trees and perennials; four ounces to the square yard is the right quantity.

Coal ashes have no manurial value, but they help to lighten heavy soils. They should, however, be very finely sifted. Coarse cinders inflict wounds on root crops, and winter potatoes especially; this is serious. Coal ashes are good for paths in a bad condition, and, moreover, they keep down weeds, which cannot grow in them.

Green Manure. Green manure is much better than no manuring at all. Mustard, rape, and turnip are all useful to sow for this purpose. These crops will all supply *humus*, and should be dug in before planting or sowing takes place in the spring.

Lime. In the strict sense of the word lime is not a manure. All crops require it more or less, with the exception of potatoes. Apart from the fact that lime sometimes induces scab on the tubers, potatoes do not need such a sweet soil as other vegetables.

Lime is a soil improver and sweetener, and it also helps certain fertilizers to do their work well. Lime opens up the soil and makes cold heavy land more friable and consequently easier to work and drain.

Ground intended for seed beds should always be limed: it is much more important that seed beds should be of very fine tilth than that they should be heavily manured.

Lime is a plant food, and essential for all fruit trees. If there is an especially fertile piece of land you may be sure that it is due, in a great measure, to the liming and chalking that was carried on by good farmers and gardeners of years ago, when liming was much more the order of the day than it is at present. They were great believers in keeping ground clean, and if we limed more we should probably have fewer diseases.

It is not so much that lime is an especially good fertilizer in itself, but it lets loose and governs most other fertilizers. Lime drains and warms the soil to such a degree that limed land can be worked up earlier and much more readily into a fine tilth than cold, clammy, unlimed soil. A seed bed can be made up on a corner of limed land some weeks before one could be attempted on unlimed ground.

Lime breaks up soil almost to the same extent as frost. Lime is a plant food and insect destroyer, and is one of the best preventives for that deadly disease clubroot, commonly known as "fingers and toes."

It is essential to lime land which has been treated with sulphate of ammonia, for sulphate of ammonia will remove nearly its weight in lime from the soil and drain it of its chief virtue.

Farmyard and other natural manure diminish the loss of lime, and among the artificials sulphate of potash, *Kainit*, and nitrate of soda, so valuable in bringing along all kinds of greens, do little harm to limed land. It is sulphate of ammonia, the most freely used of all artificials, that is such a lime drainer.

Those having grass land, and land that varies to a great degree in parts, may be guided by many signs as to whether it needs lime or not. On land that needs liming the grass is coarse, what is called "bent" grass is very abundant, and clover will not flourish. Sorrel will abound on such soil, so that its appearance is always a sign that lime is needed.

Apply lime on newly cultivated land as long as you possibly can before sowing crops, to give it ample time to do its work of sweetening, should the soil be acid. In using lime on land already under cultivation, it must be applied at least ten days before any sowing or planting is done. If you are intending to cultivate a piece of grass land in the spring, apply lime to the removed turves in the autumn, and it will help decompose them before they are dug in for manure.

Never apply lime at the same time as manure, as the lime will drive out all the ammonia from the manure long before it has done its work.

Ground prepared for seed beds should be limed a fortnight before the seed is sown. It should be applied so that the ground looks as though there had been a very light fall of snow. Dressings of lime must always be given lightly, for lime given in heavy doses quickly drives all the valuable nitrogen from the soil. The best way to apply lime is to shake it through an old coarse-meshed sack. The lime is then very lightly and very evenly distributed, and does its work of sweetening well without taking its toll of the soil.

Water-logged soil must be limed more frequently than a good open soil, and clayey soil should be limed frequently.

Clay is not a coarse soil. The reason for its heaviness is because its particles are so extremely fine that they all clog together in a gelatinous mass, and the more such soil is interfered with in wet weather the more sticky it becomes. For this reason one should never attempt to manure or dig clayey soil immediately after rain. The fine particles are spread about until the whole plot is in a deplorable state of stickiness. Lime will help collect these particles and prevent them spreading.

Frost also will do more to help break up this heaviness than anything. Leave as much surface exposed as you can, turning up the clods during a fine day with a drying wind blowing.

Heavy sour land should be limed first and manured later, and soil under good cultivation, but needing enrichment, may be manured first and limed afterwards as a sweetener before sowing and planting.

Mortar Rubble. Any rubble that contains mortar, such as collections in chimneys after high winds, or stuff from falling ceilings, or from any house repair, should always be dug into the ground. Mortar rubble, old cement, etc., taken from walls and ceilings, is an ideal manure for soils deficient in lime.

To apply dustings of lime or spent soot to seedlings when the sun is blazing is useless. It should be done very early in the morning or in the evening when the dew is on the plants

To Slake Lime. It is best to buy unslaked lime and to slake it oneself. Heap the lime in a mound on the bed to be limed, and sprinkle lightly with water through a rose. In a few minutes steam will rise. Sprinkle at intervals of five minutes or so, till the lumps have slaked to the consistency of fine powder. Then rake over the bed. This should be done on a windless day, and care should be taken, for the lime is very hot. If wireworm or clubroot, etc., are prevalent, this is the best way of treating the bed (unless it can be gas limed).

Two ways of testing whether soil is deficient in lime:

1. Take a handful of the soil in a fairly dry state, rub it fine, place it in some shallow utensil, and then pour some spirits of salt over it (one part spirits of salt to two parts water). If it effervesces slightly there is lime present.
2. Buy some blue litmus paper (2*d.*), and place it against a moist sample of the soil. If the paper turns red within half an hour the soil is acid and requires lime.

Gas lime is excellent for soil infested with wireworm, but nothing can be sown or planted with safety for three months after it has been applied. For wireworm apply half a bushel to the square rod in autumn, and it may remain on the ground till February, when it can be dug in. The smell of gas lime is appalling, and if the plot is near the house it should only be applied when everything else has failed.

Oyster Shells. Oyster shells burnt to a fine ash (by placing them in the centre of the rubbish fire in the garden) make a splendid fertilizer. The ash should be placed round stone fruit trees, or on any portion of the garden that is especially unworkable.

In certain parts of the world the only manure to be obtained for crops is the refuse from oyster beds, and very fine crops it produces, being a pure lime when quite decomposed. Oyster shells crushed to a fairly fine powder are much appreciated by hens.

Road Grit and Scrapings. These are ideal for new heavy ground, as they are full of penetrating grit, sand, and manure, but always provided that they contain no tar or petrol. These are *very* poisonous to plant life.

Salt. Salt should not be used in cold clayey soil, for it only makes it colder. Salt is of the greatest use on light dry soils, especially for celery, cabbages, asparagus, and other salt-loving things, as it not only suits these crops, but conserves moisture in them.

Seaweed for the same reason is useful on light soils, but not on heavy (see Seaweed).

For young crops of beets, parsnips, onions, cabbages, carrots, leeks, and celery apply about one ounce of salt to the square yard. Cabbage plants showing signs of the ravages of caterpillars should be syringed with salt and water. A piece of salt about the size of a large walnut to one gallon of water is the right quantity. All insects dislike salt. Wild cabbage which grows near the sea is never infested with caterpillars to the same extent as the garden variety.

Seaweed. Seaweed may be used either as a manure alone or mixed with part-rotted stable or farmyard manure, but in both cases it should be stacked up and covered with soil some time before it is wanted, allowing that to which manure has been added a longer period for decomposing.

Seaweed may be stored up in several ways. One method is to stack it for several months as tightly as possible and covered with a good depth of soil. By the end of three months it will have become a perfect form of *humus*. Another method is to mix it with half-rotted manure before stacking as above.

A ton of fresh seaweed yields about thirty pounds of potash—enough to manure half an acre of potatoes. When it can be obtained it should be spread on ground intended for this crop.

Peas planted with a good layer of seaweed in the subsoil will withstand almost any drought. All the brassica, tube, celery, and asparagus are particularly appreciative of seaweed, chiefly on account of the salt it contains.

Soot. Soot should never be kept very long, as it soon loses its virtue. After ten days it is quite safe to use it to dust plants and to keep off various pests. The evening is the best time to apply it when foliage is damp with dew.

Soot and lime may be applied together to trap insects, but never as a manure—the lime sets free the ammonia in the soot too quickly, and its value is lost. Soot applied to growing plants will make them a healthy, vivid green, but " little and often and not too close " is a safe rule to go by.

If not wanted for any special purpose, put all soot fresh from the weekly flue-cleaning on to any vacant bed. It is too valuable to waste.

A spadeful of fresh soot is sufficient to make about twenty gallons of liquid manure: soot water is frequently applied too strong. Soot is an excellent substitute for sulphate of ammonia.

Vegetable Refuse and Leaf Manure. Decayed vegetable refuse is full of the *humus* that is so necessary for all crops, and much that is usually burnt in the way of pea and bean haulm should be dug in, especially the roots, which contain a certain amount of nitrogen, for nitrogen is one of the most expensive fertilizers to buy.

Such stuff, however, as cabbage stumps and the leaves and roots of other greens should certainly be burnt, as they often breed the germs of clubroot and other deadly diseases. Experienced gardeners always burn refuse from the brassica tribe. Once reduced to ashes, things that are a menace to the well-being of the garden, if left lying about, become most valuable fertilizers, as most burnt rubbish is full of potash.

Many gardeners underestimate the value of decayed vegetable refuse. It is very nearly as valuable as manure from indifferently fed animals, and on light soils it is invaluable, not only as a manure, but also because it conserves so much moisture.

All fallen leaves (excepting from evergreens) should be collected for leaf manure. There should be either a little wire or wooden enclosure in every garden for fallen leaves. Every fresh addition should be sprinkled either with soot or lime to kill insect life and to help forward decomposition. Leaves from big trees (especially oak and beech) are of the most value. The tissues of those from wall creepers, etc., do not contain much nourishment, but none should be wasted.

Burn all fallen leaves, etc., from evergreens. They are useless as leaf mould, but they make good potash.

House refuse systematically placed between layers of soil with sprinklings of soot or lime as purifiers makes valuable material for all crops. Slops should be poured on the heap as they are full of ammonia and help decomposition considerably.

Water containing soda may be applied to cabbages if it is not too strong, and any water in which greens have been boiled can, when cold, be used for the garden. Many gardens have very little spent on them by way of bought manure, but everything possible is utilized from the house to make food for the various crops.

Bones from the stockpot may be put into the centre of the bonfire, and these, when burnt, will crumble to bonemeal which is good for all vegetables. By a gardener *no* house refuse should be regarded as rubbish. It is all invaluable stuff. The Board of Agriculture has a pamphlet on the value of shoddy as manure, and in this pamphlet it is pointed out that the more finely shredded the shoddy is, the greater is its manurial value. It would be scarcely possible to have it more finely grated than in the daily carpet sweepings.

Every home garden should have its own compost heap, and with careful management there need be nothing disagreeable or unsightly about it. Dig out a hole to the depth of four or five feet, banking all the released soil neatly round three sides, leaving the fourth side open. Into this pit all house refuse may be thrown—vegetable and fruit peelings, fish bones, slops, carpet sweepings, tea leaves, coffee grounds, etc. Each day earth should be thrown over the rubbish to cover it to the depth of about an inch, and in this way the heap will be free from any smell and rot away to a rich black *humus*. This makes ideal soil.

No garden can flourish long without *humus*, which is simply decayed animal and vegetable matter, and of which tons are wasted annually by way of the dustbin, instead of being returned to the earth.

If a compost heap is undesirable, it is a sound plan to trench systematically, so that there is always an open trench for what is generally called rubbish, but which is really invaluable manure. There will be no smell if every day a little earth is thrown over the refuse which is added. In the driest summer, vegetables grown on the sites of these trenches never suffer from drought, and the crops are magnificent without either artificial or natural manures

SECTION IV

ODDS AND ENDS

Bird Scarers. Birds hate a mystery, that is why they so dislike black cotton. They suspect a trap when they get entangled with something they cannot see.

A stuffed figure may puzzle them for a day or so, then they will perch on it while they consider what to attack next. A perfect scarecrow must be kept in perpetual motion.

Bits of broken looking-glass, or very light bits of tin, suspended from a stick, will glitter and twirl about with every ray of sun and breath of wind, and keep the birds at a distance.

An old muslin curtain stretched over a row of peas, etc., acts as a good protection from the birds and is little trouble. Attach the muslin to two pieces of bent iron—old croquet hoops answer admirably—but anything will do so long as the material is quite firmly fixed just above the ground. Seeds contain a sweetened malt that assists them to germinate, and the first leaves are consequently very smooth and sweet. Once the second leaves appear, the crop is left in peace, and the muslin can be removed.

Bonfires. A sunken fire will burn with the least smoke. Dig a hole about two feet deep near your rubbish and put into it newspapers and any dry oddments. Get this well alight and then add the driest of the rubbish until there is a steady smoulder. If you do not care to take the trouble to sink your fire it should be started over two raised hoops. Two croquet hoops crossed do splendidly. This method enables air to circulate freely.

If any gooseberry bushes or fruit trees are worried with insect pests, as a preventive make your bonfire so that the wind will carry the smoke in their direction, and many of the insects will succumb to the fumes. The fumes will not kill them outright, so some reliable insecticide should be sprinkled round about the trees, or the surface soil be carefully scraped and added to the bonfire.

Digging. To grow good vegetables dig, dig, and still dig. Every time you stir the soil you let out bad gases, expose hidden insects, and open up new mines of important minerals for the benefit of your plants.

The soil is not dead matter; it just teems with life, both destructive and useful, and the more it is cultivated the more the good bacteria in it will increase to the discomfort of the bad. Many connect the word cultivation with the growing plants, but it is the soil itself that must be cultivated before plant life can flourish.

It must be periodically deeply dug and constantly surface-stirred, and for this reason flowers and vegetables should never be planted so closely together that you cannot work between them with a hoe. When a new piece of ground is being broken up, old experienced gardeners first dig it from north to south, leave it for a time, and then dig it from east to west. By this method the ground is much better broken up than by using the spade in the same direction twice.

When digging, do not bury frozen lumps of soil. Crops that are struggling along in the spring do not want to be checked by coming in contact with young icebergs. When ice is buried deeply, the sun cannot raise the temperature of the soil. Don't dig the ground when snow is lying on it. This makes the soil so wet and sticky that it is not possible to do anything with it for a long while afterwards.

If wireworms or other serious pests are turned up by the spade a good insecticide must be dug in. After deep digging and applying a pest destroyer leave the soil as it falls from the last touch of the spade. Don't rake. Apart from the benefit derived from frost, rain, and wind by the exposed surface, the soil will become charged with nitrogen and other plant food. Not nearly so much of this precious food can enter a bed with a level soil as it can a bed with lumpy clods, each having several surfaces. It should be borne in mind that soil obtains the largest portion of its plant food from the air.

Clayey soil is the worst, and if badly drained little can be done with it, but once drained and lightened it gives excellent results, for it will never be so light that it will not retain a certain amount of moisture.

Materials for lightening heavy soils are plenty of sandy grit, as long as it is free from tar and petrol, burnt rubbish of any description, and builders' rubble, which may be bought quite cheaply. On very heavy soil a sifting of coal ash may be used and worked in now and again, but the ash should go through a very fine sieve to be lightly and evenly distributed, and it should never be used near seed-sowing time. It is worthless as a fertilizer, and seed falling on it would fail to germinate properly.

The gardener's best friend is frost, as regards a clayey soil, and the more roughly the soil is left exposed during the frosty weather the more surface will be pulverized. Clayey soil should never be worked in wet weather, for the more the soil is disturbed the more matters are aggravated; the fine particles which compose the clay being turned up in sticky clods. Nor should barrows be allowed in wet weather, causing puddles of water to form that cannot drain away.

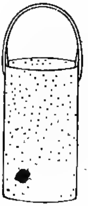
Draining. For draining a portion of the garden, without the expense of outside labour or pipes, much may be done by digging out the soil to a depth of at least three or four feet and filling the bottom of the trench with a deep layer (about one foot) of twiggy cuttings, builders' rubble, or stones. It is essential to make some drainage of this kind before planting big fruit trees, or there may be plenty of vigorous growth, but no fruit.

Fruit trees are often barren because they are planted without drainage. Deep-rooting fruits and vegetables cannot be grown in badly drained ground. Grass, too, will never look as it should. It will crack and bake in the summer, and be a quagmire in the winter. Badly drained soil is very difficult to work at all times, and badly drained lawns all but hopeless.

To test whether ground is badly drained dig a little pit, about three feet in depth, in a corner of the garden, and watch if water collects in it and does not drain away. It is not a difficult thing to drain a lawn with small pipes. The turf should be cut out and a main drain run towards the lowest point of the garden. Most lawns are fairly level, but the garden itself generally slopes a little in one direction. Minor drains should run *across* a lawn or garden. This is very important, as by draining only *down* the slope you merely drain the soil lying just about the pipes, but if minor pipes are laid across the slope you catch the water running between the drains.

Drinking Water for Birds. There should be a bird-bath in every small garden, and several in large gardens. Birds are often very thirsty (hundreds die in a prolonged drought for lack of this little attention), and besides the cruelty of not providing water for them, they do considerably less damage to fruit if there is a good supply of water. They attack the fruit very largely for the moisture in it. The water, however, must be kept clean, for naturally they will not take dirty water when clean fruit is to be had. Nearly everybody feeds birds, and it is curious how many quite kind-hearted people never seem to think they also need water to drink!

Dusting Plants with Soot, Lime, etc.



Dusting plants is an awkward job to accomplish by hand. Failing an old flour dredge, punch a number of holes in an old tin and make a slit on both sides through which to pass a strap of webbing. The dusting can then be done evenly and easily.

Protecting Plants from Early Autumn Frosts. Bracken litter is excellent for protecting tender plants during frosty weather (but do not cut away the old fronds from hardy ferns for the same purpose! They should be left in position to protect the new growth forming at the base of them through the winter). Straw, bracken, or heather, placed along the roots on the side open to the winds, will do much to prolong the life of French beans and scarlet runners. For marrows, ridge cucumbers, and tomatoes, old muslin curtains, or even butter muslin, give the best protection. Remove during the day. Cauliflowers showing the curds should have a leaf or two snapped over them. Evergreens laid along by the beds of seedlings are splendid for protecting them from cold winds.

Autumn-sown Crops to stand the Winter. These are often ruined through want of a very little attention. Dead leaves blow about, and unless they are constantly removed from winter spinach, lettuce, onions, etc., they are bound to cause rot and decay.

Protecting Seedlings in Frames. Protect seedlings in frames in the cold weather by covering the glasses with old sacks at night. Water, if necessary, with slightly tepid rain water.

To give plants in frames the slight protection of a piece of matting during very severe frosts is not enough: there should be something extra by way of litter. Dried bracken and straw are usually recommended, but more compact protection is better. Fairly clean dry stable litter is the best to use, or any other dried litter free from straw or dry leaf mould is good—anything that can be spread to a depth of five or six inches, covering the whole with the mats or canvas as usual.

Of course, if snow has fallen there cannot be anything better than this, as it is Nature's own protection, and if the frames are absolutely watertight, six inches of snow may be evenly shovelled on to them. In a glasshouse newspapers are a wonderful protection.

Clamps. Clamps of potatoes, beets, and other stored vegetables should also have extra protection during severe frosts, and a certain amount of dry soil should be placed under cover all ready for the purpose. Soil is the easiest and cheapest thing to use.

Protecting Winter Greens. Hundreds of fine heads of broccoli and cabbages are lost every winter through frost, and this would never happen if the soil were drawn up slightly round the stems as the autumn advances till it is four or five inches high. Apart from protecting them it keeps them very upright and steady at the roots.

Many market gardeners ridge the ground when planting out winter greens, placing the plants in the centre of the little valleys between the ridges and thus protecting them from cutting winds. On exposed ground it is the cold winds we have to fear more than anything else. Snow does little harm to anything; in fact, it keeps plants warm.

Tools in Frosty Weather. Wipe and polish all tools after using. Turn all watering cans upside down. Dribblings of water cause rust, and rust makes holes.

Look over stored tools every now and again. Iron sweats, and a sudden change of temperature will cause moisture to exude from many tools and this will rust unless it is removed.

Care of the Grass-mower and Hose during Winter. Put away the grass-mower for the winter in a clean dry condition. Wipe the blades free of all grass and oil them. Also oil between the wheels. The machine is best brought indoors unless you have a very dry shed.

The hose should be quite free from any drippings of water and then rolled up for the winter.

Gathering Crops. Gathering crops of any kind is an art in itself. The way some people wrench off peas, French beans, sprouts, kale, broccoli, etc., is enough to make any self-respecting plant cease bearing. Some gardeners get double what others do simply from the way they pick; you will always notice that an old-fashioned country gardener is very careful in this respect, and he naturally resents people picking who treat plants as though they were made of cast iron.

Peas and beans (both dwarf beans and scarlet runners) must all be kept well picked. Unless vegetables such as peas, beans, marrows, etc., are very carefully gathered after mid-September they soon cease to be productive. If peas, beans, marrows, and cucumbers are left long enough for the seeds to harden, they will produce no more.

Marrows and cucumbers can be kept fresh for days if the stems are placed in water, but no part of the vegetable must touch the water. Marrows to be kept through the winter should be placed in string bags and slung in a cool dry place. If suspended without support by the stems, the weight of the fruit often causes them to break away.

Peas which have to be gathered, but are not wanted at the moment, should be wrapped in a damp old curtain and plunged into water a short time before using. Runner and French beans will keep in the same way. Even when limp they will plump up quite fresh after being in water for a while. To keep lettuces fresh for a time, pull them up by the root and stand the roots in water, but keep the water well away from the leaves.

Hoeing. Spend all your odd minutes hoeing. On an experimental plot in America it was recently proved that potatoes hoed up every four or five days yielded a forty per cent. increase in crop over those that were grown in the ordinary way.

Hoeing keeps down the weeds, but this is the least of its beneficial effects. Most important of all, it lets the air down into the soil. If roots are in an air-starved soil they cannot flourish, and the plant as a whole suffers. In a general way, if you feel inclined to use the water pot, use the hoe instead.

Crops hoed regularly from their seedling stage do not flag, even in the driest weather. The Dutch or push hoe is the one to use between the rows of vegetables. Stir the soil to the depth of about half an inch, and keep to within an inch or so of the plant, even more with onions, to avoid root disturbance. Work backwards, leaving the soil free from footmarks. When hoeing quite near to plants, work the soil towards them, giving the plants more protection, not less. The swan-necked hoe is the best for keeping weeds down.

About eighty per cent. of plant food is supplied in the form of rain and gases, which unlock the heavy matter in the soil. The more you hoe, the deeper the air can penetrate, and the better your plants will be fed. Catch crops grow so well on celery and other ridges because the soil in such places is very porous, and the life-giving air can reach them freely.

Level soil can be brought into the same condition if it is well dug in the first place, and after that frequently hoed. Before you go away for any length of time, give all your flowers and vegetables a good hoeing. It will help them more than anything else to look after themselves while you are away. It is also a good plan to bare the garden of flowers and buds likely to bloom in the immediate future and form seed pods.

Hot bed. To make a hot bed: Twelve to fifteen barrow-loads of stable manure will be required for each frame, with lights about three feet wide. Leave the manure in a heap to ferment for about a week;

then turn it and shake it well apart with a long-pronged fork. Do this every two or three days, until the whole mass is equal as regards colour, the light-coloured straw darkening and easily coming apart when forked.

The stuff can now be placed in layers in the frame, each layer being banged down with the back of the spade or a turf beater until the bed is about two-and-a-half feet high. Many gardeners build the bed higher by half a foot at the back of the frame than at the front, but the benefit of this is a moot point. When a bed slopes, and the boxes placed at the raised end are watered, all the moisture drains down to the boxes in the front of the bed and seedlings often damp off, whilst those in the back boxes are too dry.

When the hot bed has to be made up on economical lines, get oak or beech leaves to eke out the manure.

Having made the bed, place on the glass and keep all as close as you can until the glass is covered with steam. If you intend sowing your seed straight into the bed, the top layer must be four inches of good mould and packed closely on the bed. Great care must be given as regards ventilation. There are often quite warm days in February and March, and then the lights must be raised, taking care to replace them at sundown, and to keep them closed both night and day during a cold spell, and to protect them always at night, whatever the weather, in case of one of those sudden changes that take place in our climate.

If any seedlings show signs of damping off, remove them from the frame at once, as damping off is a disease and very catching. Old windows which come in very usefully for home-made frames can sometimes be bought very cheaply at a builder's.

Insects and other Pests, etc. There should be a general insect hunt towards the end of February before they get the upper hand. Take one of the house brushes and a dustpan and sweep well under the projecting wood on fences and under the eaves of sheds, greenhouses, etc., for those hanging little brown chrysalises one so often finds develop into grubs, the many winged creatures that lay thousands of eggs, which in their turn become distinctive maggots and grubs.

Search out the snails from under the ivy and lay traps for the tiny grey slugs that love the first growth of so many plants. Slugs cannot resist oatmeal, and many may be trapped by covering a little over with flowerpots. They also like bran, especially if it is damped with milk or beer.

Field-mice. Place small branches of elderberry round plants you wish to protect from field-mice, and bury leaves of the same under ground where the mice are likely to run. This is a good old-fashioned remedy. Both insects and small vermin detest the smell of this tree. Most encyclopaedias give the information that this tree throws off narcotic fumes. Country people will not place a baby's perambulator under an elder-tree, although they can seldom give a reason for this. Elder is invaluable for insect and other pests

Gnats. Eucalyptus oil is a good protection from gnats, and oil of geranium is far better. Sprinkle it on yourself, and especially round your ankles. A lead lotion is a splendid remedy if applied immediately, but not so efficacious if the poison has begun to spread.

It is the female gnat which is so bloodthirsty; the male spends his time dancing in the sunlight. The female has a long trunk-like nose with which she stings, and when you hear a buzzing sound she is on the prowl, for the wings of the male do not make nearly so much noise as those of the female when in motion.

Gnats and the Rain-water Butt. If you have a rain-water butt you will find gnats hovering over it in fine weather, making it a depositing place for their larvae. Near the house a rain-water butt is frequently a nuisance. A good plan is to place about a pound of charcoal in a muslin bag and drop it into the butt. This will keep the water sweet, and insects prefer it otherwise!

A little paraffin sprinkled on the water is also a good idea, and does no harm to the plants, but one cannot use it for bathing purposes. When a rain-water butt is beneath the window of a room occupied by children, something should certainly be done to prevent it being a breeding-place for gnats, or there will be many restless nights in the nursery owing to insect bites.

Green Fly. Syringeing does not always remove green fly, and it is a good plan to prepare a mixture of quassia chips and soft soap; dip an old sponge in the liquor and sponge the plant with it: but there must be an inspection the next day, as if only a few flies are left, they will have grandchildren within forty-eight hours.

Aphis always attack weak, sickly plants. Healthy plants are less prone to attack.

The old leaves and stumps of lettuces are full of a laudanum-like sap which is fatal to small insects. Boil the coarse leaves and stumps in plenty of water, strain, and when cold, syringe it over any plant affected with aphis.

Wireworm. The wireworm is a rigid, lazy-looking insect for all the active work it does. It is generally understood that the wireworm is the larvae of the click beetle, but there are quite a dozen kinds of beetles whose eggs turn into wireworms of sorts. The female lays its eggs under the ground in the summer, and when they are hatched they have, for an insect, quite a long lease of life—five years. They then change into a chrysalis state, and again become beetles, and start laying their deadly offspring all over again.

Rape cake is one of the most successful traps. An excellent remedy is to sow rape seed thickly. Wireworms are so fond of rape seed and rape cake that they will feed on them until they actually die of repletion. The ground where this pest is known to have flourished and died of overfeeding must be thoroughly cleansed before it is cropped again. It should be dug and re-dug and limed with ordinary lime, if gas lime is not available (but gas lime it if possible), for though the large majority of the wireworms are dead, there may yet be some not quite so greedy!

If you have any old potatoes unfit for food, or seed stuff of no use, place them where the wireworms are busy with your crops. Any pieces of any root vegetables will trap crowds of them, but drastic measures must be taken if the ground is to be cleared entirely of them.

Wireworm Trap. Twist a piece of perforated zinc into a cone and fit a wire handle to it. Fill this with cut pieces of potato or carrot, and then bore a hole in the ground and drop the trap into the hole. The wireworms will crawl in to get at the bait and remain there. Pull up the trap every other evening and dip in a bucket of boiling water.

Slugs. One of the best protections against these is a circle of ashes, unslaked lime, or soot. Orange and lemon peel, pithy side downward, thick peelings of swedes, slices of carrot, lengths of wood, rather rotted for preference, all make good traps. The slugs collect thickly under them two or three times a day.

There are few better traps for slugs than orange peel: lemon peel will do almost as well. Place the halves where the slugs abound, and remove them from their shelter two or three times a day if possible. If the weather is at all damp you can always rely on a catch. Lettuce or cabbage leaves, smeared with lard, are also splendid baits.

Snails. All snails' eggs (they resemble small pearls, and are frequently found under clods of earth) should be destroyed. Snails are perfectly indifferent to soot and lime, and hand-picking is really better than most poison traps, and, moreover, it is cruel to use poisoned baits which do as much harm to birds as to snails. Thrushes should be encouraged, especially by feeding them during the winter. Then they will work hard to clear your garden of snails through the other months.

Coral Rash on Pea and Bean Sticks. Distinguished by their being covered round their base with a tiny red rash. These sticks should be burnt, or they will soon spread disease.

Cats. Cats may be kept off special beds by inserting a small uncorked bottle with a little strong ammonia in it. Use two or three bottles if necessary.

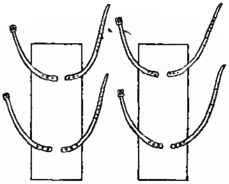
Another good thing is a little chloride of lime placed about the plants, but the lime must be in some sort of vessel as it is a plant poison. Cats will often sharpen their claws daily on some special tree of value, and such trees should be protected with a bit of old canvas.

Rabbits. Rabbits dislike petroleum intensely, and where they do much mischief pots of petroleum placed near the plants which they mostly attack is a good way of discouraging them.

Rabbits nibbling the Barks of Fruit Trees. Unless stopped this will ruin the trees. Mix any fresh manure to hand—cows' or pigs' for choice—with some clay into a thick paste, and spread it all over the barks of the trees as far as the rabbits can reach and the mischief will stop. After heavy rain apply again.

Frogs and Toads. Encourage in every way the type of small boy who brings one frogs and toads. Frogs and toads are two of the gardener's best friends. They appreciate the attention of having an earthenware saucer, frequently replenished with clean water, kept in the shadiest corner of the garden for them.

Miniature Oak Edge for Edging Beds. This makes a charming edging for a perennial border, and the pinky bronze of the tiny oaks shows up well against the green. Sow the acorns thickly and evenly together, and when the required height keep within bounds by clipping frequently. Acorns do not keep for long; if they cannot be planted at once, they should be stored in fairly damp sand, but it must not be so wet that it will cause the seeds to germinate.



Mud Pattens. If you have to work in muddy or clayey soil it is worth while making a pair of mud pattens for your boots. You will need two pieces of wood about six by thirteen inches. They are fastened on with cord or straps. Note that the cord should be close to the inside of each patten so that you can dig with them on.

Mulching. All available material should be saved for mulching crops in case very hot weather sets in. Mulching is much more effective than deluging with water from the main. Seaweed may be used with advantage for this purpose, especially for celery, cabbages, and other moisture-loving and marine plants. A mulch should be about three inches deep and free from insect pests. Lawn mowings make very good mulches as they are usually free from insect pests.

Paths. Gravel is dear, but paths may be renovated very cheaply and with little trouble in the following way:

Fill up the sunken and wet places with coarse cinders and ashes, and roll them in or bang them down with a spade. Then cover with small clean stones taken from beds and borders. Small stones picked out when digging or in tidying beds, etc., should never be thrown away, but kept in a heap for this purpose. They come in very handy also for drainage in pots when broken crocks are short.

Potting Mould for Cuttings. The very best mould in which to start cuttings of any description is that which is thrown up by moles. If this is mixed with a little sand you will seldom have a failure.

Seed Saving. Peas, beans, and perhaps onions, if the heads are well ripened off, are the only vegetable seeds worth saving. It is pure folly to save one's own seeds from various greens when, for a few pence, seeds of these can be obtained from the best firms.

Some firms grow these cabbages and other greens for seeds a mile apart to keep them as true to variety as possible, and even then there are sports, bees going as far afield as three miles and over in search of material for honey.

Shaving-brushes. Don't let these be thrown away. They are easily the best thing for washing off green fly.

Soil near Fences and Walls. The soil near fences and walls is usually very poor, and if there are gutters overhead it is probably sour from constant drippings.

Before planting climbers, etc., in such places a good deal of the old soil should come out from each station where you intend planting, and the subsoil should be lightly forked over to help drainage. Climbers, wall-fruit, roses, etc., are not deep-rooting subjects, and your object should be to keep their roots near the surface.

On the top of the subsoil, *i.e.*, about two feet deep, place any old odds and ends of bricks, broken tiles, or mortar rubble to act as drainage; then fill up with good loam. If you have no soil suitable, it is economical to buy a load if you really want to obtain good results.

The stations may then be left until planting time, when some well-rotted manure can be added, but it must not come anywhere near the roots of the trees or plants.

Thinning out. If such crops as carrots, turnips, beet, and parsnips are left too closely together, the sun cannot possibly reach the roots to draw off excessive moisture, and there will be a lot of canker, parsnip rust, and other diseases. Thin drastically and thin early.

Tobacco-ash. Ends of cigarettes, tobacco-ash, and the refuse from pipes should be kept. Tobacco-ash can be used dry for insect pests, and the refuse diluted in water for the same purpose.

Turves. All old turves should be stacked, grass side downwards, and if a little manure is sandwiched in between them, they will make valuable turfy loam later.

When preparing ground for peas and beans, turves taken from grass land can be used in the trenches. Cut them up into small pieces with the spade and put them, grass side downwards, in the trench.

If wireworm or other insects are present, burn the turves to a fine ash and use the ash as a top dressing for the onion bed.

Watering. Vegetables that should never be watered at any time :

Artichokes, carrots, parsnips, potatoes, broad beans, beetroots, and turnips; shallots and onions which have not been transplanted.

Vegetables that require water after transplanting until they are established, but not afterwards :

All the brassica tribe, cauliflowers, celery, leeks, and transplanted onion seedlings.

Vegetables that require plenty of water in dry weather as soon as the pods begin to form :

Peas, French beans, scarlet runners, tomatoes, cucumbers, and marrows.

Parsnips, carrots, beets, and onions will all stand a prolonged drought if the hoe is kept going. There is hardly any nourishment in water from the main.

Never start watering in the open before it is absolutely necessary. Many amateurs drag out the hose during the first hot days of May, and when the soil is surface-dry, with the result that many freshly planted perennials, which have not become established, rot away at the roots.

When watering avoid wetting the stems of the plants early in the year. The crown (the portion of the plant that divides the stem from the root) often rots away through being deluged with water.

Many plants, chiefly those with fleshy leaves, droop at noon, to take on a crisp appearance again at sunset. The temporary wilting is caused by the sun drawing the moisture from the leaves more quickly than the roots can supply it. Matters right themselves with a cooler atmosphere.

When watering beds just planted with seeds, use the finest rose spray possible, and do not hold the can high up, or you are apt to wash the seeds out, and in any case disturb them seriously.

Watch newly-sown beds in hot weather, as they are useless if allowed to become very dry after they have once germinated.

Quite a good way to water seeds in boxes is to place a piece of muslin over the box, keeping it in place at both ends with a stone, and to water over the muslin with a rose-can held high up.

It is better for seeds not to be watered until they germinate, and if the soil is just right as regards moisture at sowing time many seeds do not want it, but if one finds the surface soil dry, water as above, and the seeds will not be washed out of the soil. Even when seedlings are in their seed-leaf or lobe-leaf stage —*i.e.*, when only two leaves have developed—keep to this way of watering if the seedlings are tiny. They are often upheaved by too vigorous attention from watering-cans.

Another point is to keep boxes level when watering, or both seeds and soil will be washed to one side of the box.

Weeds. Spring and autumn are the times to wage war against weeds. If the downy heads of thistles, dandelions, and the lesser ragwort or groundsel are left, the first strong breeze will blow the seeds all over the garden.

Chickweed and pimpernel are full of ripened seed in late August and September, and unless destroyed, will give endless work the following spring.

Wheelbarrows. The light galvanized iron barrows are the best and the cheapest in the long run. The handles of a wheelbarrow should never be gripped: hold quite lightly, and the handles should *rest* in the curved fingers and not be held by them. The barrow should only be lifted off the ground far enough for it to run smoothly; the higher it is held, the heavier it will be.

Worn-out Forks. If your old garden fork has worn down to half its length and been discarded for a newer favourite, don't scrap it. A most useful cultivator can be made out of it for sixpence with the aid of the local smith. Get him to heat the steel and bend the prongs backwards from the neck until they are at right angles to the handle-shaft, and then to curve each prong separately still further into a claw; the outer two are best brought in a little more than the centre ones. Then, with a new stick for handle, you have a splendid implement for loosening and aerating the trodden soil between rows, for uprooting weeds, and for knocking together and levelling rough land.

MONTHLY CALENDAR

ALTHOUGH there must be an accepted time as a guide to would-be gardeners, one must never lose sight of the fact that it is the *weather* which must be taken into consideration, and not the *calendar*.

This is especially the case as regards seed-sowing, and the planting out of such subjects as tomatoes, marrows, etc., brought forward under glass.

Then the climatic conditions of a garden must also be taken into consideration, for one may sow and plant in a sheltered garden in the south a month or six weeks before one dare do the same work in cold soil in a northerly garden. Much, then, must be left to the common sense of the gardener, and no hard and fast rules can be laid down on the subject.

JANUARY

Prepare ground in warm, sheltered borders for small salads, spinach, early cabbages, and short-horned carrots.

Globe artichokes should be protected with some light litter as the weather is, as a rule, more severe after Christmas than before it, and this plant is not quite hardy.

Asparagus beds should be manured, but there should be no disturbing of the soil. Rain will wash the goodness down. Use seaweed for the purpose if you can get it.

Prepare the soil for early broad beans: early crops are usually free from blight, but only in the most southerly and sheltered gardens should peas be risked.

Cauliflowers may be sown in gentle heat, or even in a cold frame if it is in a sunny, sheltered position, for planting out in early April.

Tomatoes may be raised from seed wherever there is a glasshouse of the small description, provided it is in a sunny position.

Dig and re-dig all ground lying fallow, and leave it as rough as you can to benefit by frost and rain.

FEBRUARY

February should be a very busy month, as in mild weather many weeds are freely growing that flower and seed early. Groundsel, especially, should be looked for and hoed up and buried deeply with other young weeds for green manure. Litter, such as bracken or boughs of evergreen, must be collected where early crops are to be sown in warm borders, as it is imperative that such crops be protected from frost.

Broad beans may be sown for main crops, and long pods are almost as early as the smaller sorts and give far better returns.

Sprouting broccoli, both white and purple, are most useful and important crops, and seed should-be sown both in a sheltered position and in a frame to avoid risk of failure.

There is no month in the year during which cabbages may not be sown, either under glass or in the open, and seed should be sown now in boxes or pans and placed in a frame to plant out for summer use.

Still keep to the short-horned variety of carrots for sowing in frames and warm borders; it is much too early for sowing long sorts.

Sow cauliflowers for a succession of plants, but only use a pinch of seed.

As a rule all seeds for successional crops are wasted shamefully. "A little and often" should be the rule for such gardening.

Mustard and cress may be sown in boxes on sunny window-sills or in sheltered spots in the open; always sowing the cress a few days before the mustard, as it takes longer to germinate.

Parsnips should be sown before the month is out, that is, given good weather. This seed is very papery and will rot if planted in cold wet soil.

Ground for parsley should be well and deeply dug and enriched, and seed sown at the end of the month for an early supply under favourable conditions.

Peas may be sown in any quantities, provided soil and weather conditions are good, but rounded varieties should be selected for early crops as they are more robust than the wrinkled sorts.

In very mild climates a small quantity of early potatoes may be planted in sheltered positions.

Rhubarb should be taken up and divided where clumps are too thick, and this plant loves a rich soil, but remember that a new plantation should not be pulled the first year, so leave a clump or two undisturbed for this season's use.

Savoys are not valued until they have been frosted, and a fine savoy needs a very long period of growth, so sow seeds now in a frame or gentle hot bed and prick out the seedlings before they become the least crowded.

Plant out shallots if the weather is good, but leave them until later if there is much rain about or they will rot.

This vegetable should have an enriched soil to do really well, although crops, of sorts, may be raised on poorish ground.

Sow plenty of round spinach if liked, as any running to seed can be dug in. It makes excellent green manure.

Sow a small quantity of a small white turnip such as Snowball, but don't attempt a sowing on a large scale this month.

Admit plenty of fresh air to all plants coming along under glass that are naturally hardy. Such subjects hate being coddled and soon become weedy in a close atmosphere.

MARCH

If work is behindhand through bad weather, give first attention to soil preparation and the making of seed beds. Nothing is gained by planting and sowing in uncultivated soil. Early crops may have failed, and these must be resown and protection given to all tender oncoming plants against the cutting east winds. With the exception of a few tender vegetables, such as runner and dwarf beans, marrow, and the like, all vegetables may be sown in the open during March, and even the tenderlings may be brought forward in a cool greenhouse or frame. Celery should be sown in mild heat for an early supply, and about the middle of the month a pinch more seed should be sown in a cold frame in a sunny aspect.

A new mint bed may be made this month if the old bed is exhausted, and herb seeds may be sown and roots divided.

Horseradish should be replanted and old beds well dug up, and all feeble growth grubbed out and burnt, or it will overrun the place.

Leeks should be sown in *really* rich, well-prepared soil as few vegetables pay better for a generous diet.

Onions may be either sown from seeds, or "sets"—these are small bulbs—may be planted, but if the ground is new, and not over well prepared, it is better to purchase onion plants in April and plant them out in damp weather.

Parsnips may still be sown, but the job should be done at once, given good weather.

Wrinkled peas of the best sorts should now be sown, both tall and dwarf, allowing enough room between the tall sorts to grow lettuces, which revel in the shade.

Potatoes for main crops should be started at once, carrying the work on into the first week in April, if other jobs need attention between whiles.

Turnips may be sown in quantities towards the end of the month, but winter greens of all sorts should be sown first in case of the less hardy failing.

APRIL

Thinning out and hoeing to keep down weeds and let in the sunshine and showers will be two of the chief jobs this month, and a watchful eye must be kept on all plants likely to be attacked by pests.

Beet should be sown towards the end of the month in well-dug ground, but without manure.

Still sow broccoli, giving first choice to the early sorts.

Be especially careful to have a good seed bed for broccoli in order that the plants may be robust from the first.

Sow cabbages for autumn use, and beds may be prepared for transplanting the seedlings as rich as you can afford.

The main crop of carrots may be sown this month, and one of the best is Scarlet Perfection.

Celery may be sown in the open ground if you have a cosy corner for a seed bed, which should have a great deal of *thoroughly* rotted manure mixed with fine, sifted soil.

Kidney beans may be sown towards the end of the month, but only in favourable weather and warm aspects, and even then only a small quantity should be risked. Frosts are often quite severe in May.

Sow lettuces in very small quantities every fortnight for succession.

Look over the early sown onions, and if not a good crop sow again for winter use. Onions for pickling may be sown thickly on rather poor ground, as a mean diet gives a crop of numerous small bulbs just right for the pickle jar.

Sow parsley for autumn supply and give it plenty of room.

Sow peas for succession, and the second earlies should be chosen.

Prickly seeded spinach yields a splendid crop for those who like it, and it should go in now. There are also the various spinach beets that are well worth growing, and the New Zealand spinach with its thick, fleshy stems growing close to the ground, but this needs plenty of room.

Keep the hoe going constantly between the turnips, and thin them drastically.

MAY

Asparagus beds sown with seeds should be thinned where two or three plants are seen together, and beds bearing should always be cut by one person if possible, then the job can be done systematically.

Broad beans may be sown for a late crop, but only in soil likely to retain a little moisture. It is useless to plant them in hot dry ground at this date.

Sow beet for main crop, and thin out early so that the remaining roots may swell.

Plant out a few of the best brussels sprouts for a treat in early autumn, and give them rich soil and a sunny position

Plant out cabbages at every opportunity after showery weather, and thin out the main crop carrots.

Cauliflowers simply must have water in a dry spell if you want decent heads, as they are the most thirsty vegetable in the garden, barring marrows.

Get your celery trenches ready so that seedlings are not growing weedy and overcrowded while waiting for their final quarters, and use plenty of manure for your foundation.

Ridge cucumbers and marrows may now be planted in the open in the sunny south, but leave the job until early June in cold northerly districts, and in every case give protection at night at first.

Kidney beans may be sown in quantities under favourable conditions, and don't forget there is a delightful climbing French bean which is far more delicate than the runner bean, and yields just as well.

Tomatoes may be placed in the open towards the end of the month in many gardens, but use your common sense as regards the weather.

JUNE

June should be a little less strenuous month for the gardener than any other, weeding and watering and light successional sowings being the principle jobs.

Asparagus should not be cut after the middle of the month, and those greedy people who continue to cut the heads until late June, and early July, will suffer for it in the following season.

Continue to plant out celery as fast as you can, and cauliflowers planted out should be well watered and shielded from the noonday sun.

Ground should be kept clean where marrows are to roam, and all stakes for peas and beans should be *very* firm, and a watchful eye kept on crops generally.

JULY

Sow coleworts to fall back upon when peas and beans become scarce, and the seed bed should contain any old crushed rubbish consisting of lime.

One can usually buy such stuff from a builder's yard, and it makes all the difference to your coleworts. Dig the rubble well in, working the surface soil nice and fine.

See that ridge cucumbers and marrows do not suffer from drought, and pick all produce as soon as it is a fair size.

Shallots may be taken up if they have ripened well, but don't hasten the job if the room is not wanted.

Leeks may be planted out on level ground in moist rich soil, but make trenches as for celery on dry soils.

There are now so many excellent late cropping peas, and Chill October or a like variety may be sown in favourable districts. Don't attempt a late crop round about towns or in London suburbs.

Potatoes should be lifted where the crop is ready, and do the job with great care to avoid injury.

Black Spanish raddish may be sown for winter use, and a yellow turnip such as Bee's Orange Jelly should be sown at this date in preference to a white sort.

AUGUST

There are still various subjects to be sown, and where the ground is very dry the seed beds should be well watered in advance with rain water if possible, or water that has been exposed to strong sunshine for some hours.

After the seed is sown cover the bed for a time with boughs of evergreens or pea sticks, or anything suitable to hand, until seed germinates.

This will conserve the moisture in the soil.

Cut down globe artichokes as soon as the heads are used.

Sow brussels sprouts now to stand the winter in the seed bed for planting out early in the spring. This plant needs a *very* long period of slow growth for perfection.

Don't be in a hurry to earth-up celery, as the process at once checks growth, but bear in mind that it takes five or six weeks to blanch well, so arrange work accordingly.

Lettuce should be sown to stand the winter, and the black-seeded Bath Cos and Hammersmith are as good as any.

Onions should be sown to stand the winter, and the best strains of so-called Spanish are the best to use.

Gather all tomatoes as soon as ripe, even if they are not needed at the moment, as the strength of the plants should be diverted to the unripe fruit.

SEPTEMBER

Get in all the cabbages you can, for the cabbage is the cook's stand-by, and coleworts and other baby kinds may be planted between the larger varieties.

Celery should now be earthed-up in earnest, choosing a dry day for the job.

Thin parsley drastically as this crop is so often ruined by overcrowding.

Have a general tidy up all over the kitchen garden as refuse from spent crops harbour any number of insects, and the rubbish cleared and burnt makes valuable potash for oncoming crops.

Where a crop is lifted, and ground is to lie fallow, give the spot a thorough digging and leave the soil rough.

Land lying fallow is not lying idle, it is taking in any amount of plant food from the air, so don't let a bit of waste ground worry you.

OCTOBER

Do all in your power this month to keep the garden clear of weeds and falling leaves, and decaying leaves on cabbages and other greens.

Leaves yellowing at the base of plants should be removed and burnt with other rubbish.

Go over turnips and parsnips and lift all dead leaves lying on their greenery or it will be affected.

Root crops matured should be lifted and stored, with the exception of parsnips, which are better dug as required. If they are on damp soil they, too, should be lifted or probably they will develop rust.

Rhubarb for forcing should be lifted and exposed to the weather in a dry spot. This checks the roots much as if they had passed through the winter, and makes them fit for forcing.

Still plant out any odds and ends of greens, as in a mild winter they often do well enough to come in useful in the spring, and they are useless in the seed beds.

Foliage should be cut right down on the asparagus beds if not already done, and the bed be cleared of *every atom* of weed, and dressed.

NOVEMBER

Globe artichokes should be protected from frost, and before doing the job cut down the leaves to within a foot or so of the ground.

Keep the litter, which may be bracken, pea or bean haulm, away from the hearts of the plants or they will decay. The object is to protect the roots, not to exclude light and air from the centre of the plants.

In sheltered gardens a sowing of broad beans may be made, but only then if the ground is well drained. Seed will rot in close, heavy soil.

Turn in leaves of cauliflowers to protect the heads from frost, and guard against a lot of thawed water lying round celery trenches after prolonged frosts. A shallow trench taken out will soon drain it all away.

Lift enough horseradish for use in case of frost, and also parsnips and artichokes.

Sea-kale should be lifted for forcing, and bear in mind that nothing is more easy to manage. It may be forced in pots or boxes almost anywhere, provided the roots are strong and healthy to begin with.

DECEMBER

There is no better time than a fine December for preparing for the spring. In fact there are weeks in the autumn when the gardener may be busy with soil preparation, which is so valuable for good spring and summer results. It is in the spring when there is so much to be done that bad weather makes it impossible to get on with out-door work, and for this reason there should be winter gardening whenever weather permits.

Trenching and bastard trenching should be done before Christmas and not later whenever possible, or all the immense benefit derived from rain and frost will be lost. Ground left rough to frost will crumble at the touch of the fork in the spring, and the starved birds will have cleared it of every insect and egg.

In bad weather pots and boxes may be cleaned, pea and bean sticks be overlooked, and above all, composts prepared for the sowing of early vegetables. There are more failures from seed being sown in any kind of soil than from any other cause, and the right compost for the right seed is half the battle in early gardening.

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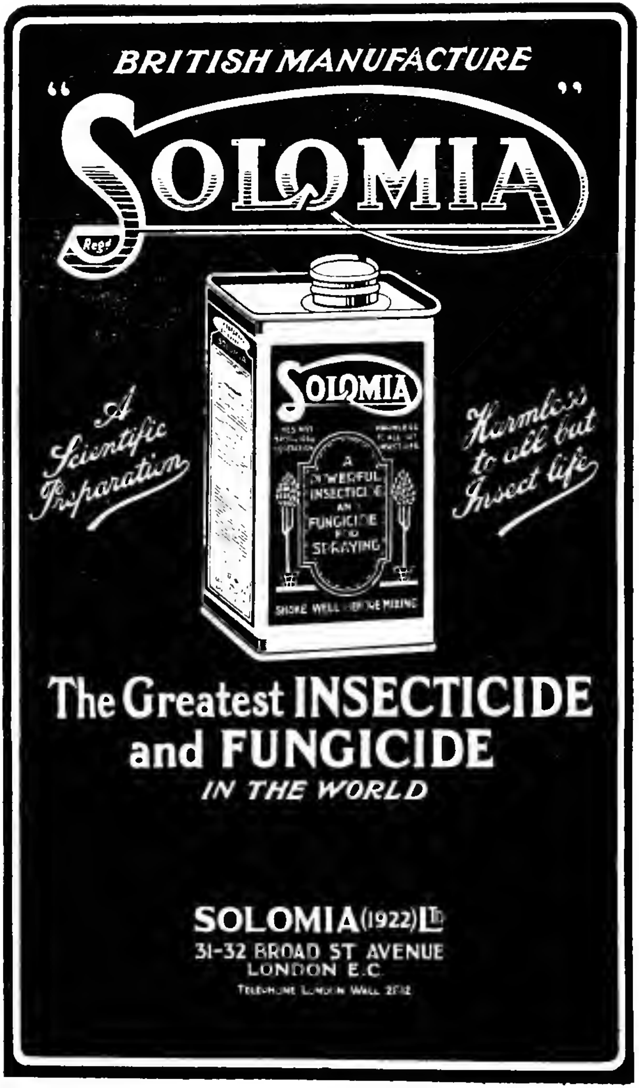
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